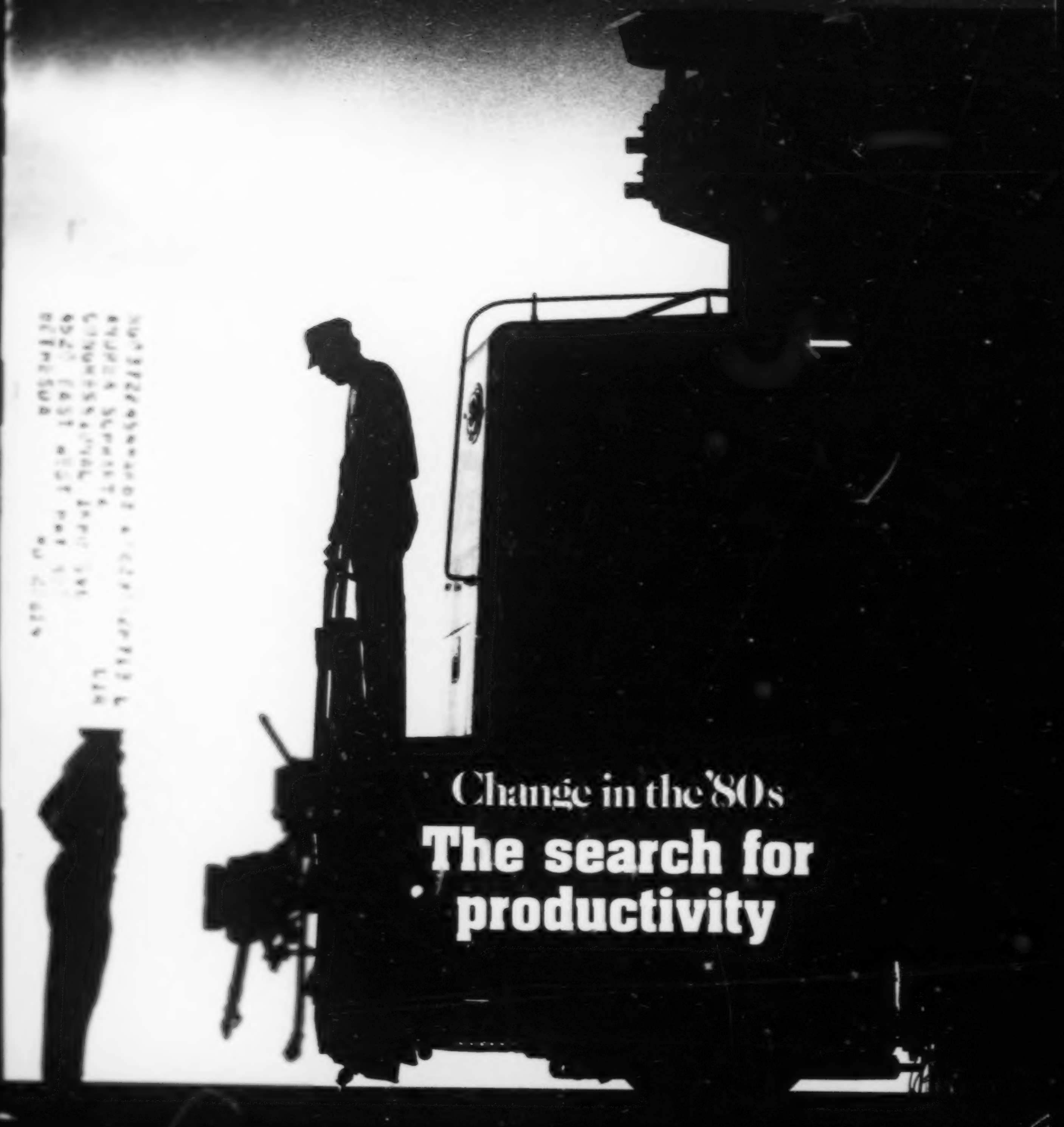
gh-speed corridors: A credibility problem?

RAILWAY AGE

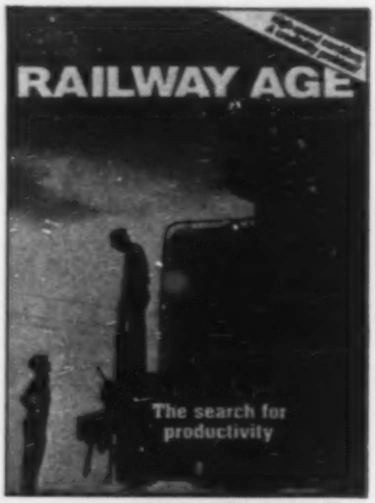


Change in the '80s

The search for productivity

RAILWAY AGE

...for the new age of railways



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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014

USPS 449-130, Vol. 185, No. 11

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years; all other countries $35 one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies $3 plus postage and handling, except special issues. Copyrighted © 1984.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT. 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

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Inside

"Just in time"—or too late?

LUTHER S. MILLER

As receivers of freight move more and more to "just in time" delivery systems—to keep inventories low and assembly-line efficiency high—the railroads are in trouble unless they can compete more effectively with trucks. That was the message clearly and chillingly delivered by Richard Haupt, director of traffic and transportation for the Ford Motor Co. at a recent Detroit seminar sponsored by the National Industrial Transportation League.

"Trucks seem to fit in with JIT, as they are smaller conveyances than rail boxcars, operate direct from door to door generally in less time than trains, and are less subject to variations in transit time," said Haupt.

He did not, however, rule the railroads out of the JIT race.

"Railroads have made enormous progress over the past several years to improve delivery reliability and reduce transit time, and they deserve recognition for their effort," said Ford's traffic chief. "But to compete in the JIT environment, they have to do more, and they can—work rule changes that allow shorter trains to move directly from origin to destination avoiding classification yards and similar delays can result in significant improvement in delivery time and reliability and make the railroads more cost competitive.

"While I think it is inevitable that there will be some shift in favor of truck transportation, given the location of major supplier plants and industry assembly plants, I think there is room for railroads to compete effectively. It is up to them to realize their potential."

What this railroad customer was saying is what the railroads themselves have been saying with increasing nervousness as they have taken note of the great productivity strides that are being made by their motor-carrier competitors.

Will the labor organizations recognize this "just in time" to prevent further erosion of traffic—and jobs—to the highways? That is one of the questions raised by Senior Editor Gus Welty in this issue's cover story, "The search for productivity" (p. 31).

Ties: Still searching for concrete evidence

Statistically speaking, the concrete crosstie has made only a small dent in the U.S. railroad infrastructure: Out of nearly 20 million replacement ties installed last year, fewer than 170,000 were of the concrete variety; the remainder were the tried and proven timber ties that have been standard for a century and a half. But while the jury is still out insofar as evidence on the long-term economics of concrete vs wood is concerned, interest in concrete ties is running high in the U.S., and even higher in Canada and Mexico, for reasons that are explored by Associate Editor John Armstrong in the story that begins on p. 64.

Market Outlook

Equipment

Bethlehem Steel: Received orders for an additional 135 100-ton Coalporter gondola cars. More than 120 of the new cars are for the Grand River Dam Authority of Oklahoma; the others are "tack-on" orders for other companies. Bethlehem is working on a similar order for Grand River (*RA*, October, p. 12) which it expects to complete by mid-November, when work is scheduled to start on the new order.

CN Rail: Will spend more than $5 million to acquire 377 crew cab pickup trucks from General Motors of Canada Ltd., Ford Motor Co. Ltd. and Chrysler Canada Ltd. Capable of moving up to six employees and their equipment to the track for repair and inspection works, the trucks can also be adapted for use on rails. • Has requested bids on the supply of 52 five-unit articulated intermodal flatcars estimated to cost more than $10 million (Canadian).

Conrail: Will acquire 100 enclosed bi-level auto racks at a cost of approximately $2.7 million. Installation of the racks on Trailer Train cars is to be completed Dec. 31.

Walt Disney Inc.: Awarded a $9.5-million contract to Messerschmitt-Boelkow-Blohm (MBB) of West Germany to upgrade Disneyland's four monorail trains.

Freight cars

	September		August	Nine months	
DELIVERED	**1984**	**1983**	**1984**	**1984**	**1983**
Built new by carbuilders	1,465	458	1,300	9,080	3,474
Built new in RR shops	0	2	0	0	202
Built new—total	1,465	460	1,300	9,080	3,676
Rebuilt	0	0	0	0	100
TOTAL DELIVERED	**1,465**	**460**	**1,300**	**9,080**	**3,776**
ORDERED					
To be built new by carbuilders	775	416	785	12,356	4,164
To be built new in RR shops	0	0	0	250	2
To be built new—total	775	416	785	12,606	4,166
To be rebuilt	0	0	0	0	100
TOTAL ORDERED	**775**	**416**	**785**	**12,606**	**4,266**

ON ORDER AND UNDELIVERED

	Oct. 1		Sept. 1	Average Backlog	
	1984	**1983**	**1984**	**1984**	**1983**
To be built new by carbuilders	5,366	3,756	6,056	6,289	4,126
To be built new in RR shops	250	0	250	111	31
To be built new—total	5,616	3,756	6,306	6,400	4,157
To be rebuilt	0	0	0	0	30
TOTAL ON ORDER	**5,616**	**3,756**	**6,306**	**6,400**	**4,187**

Source: Transportation Division, AAR, and the American Railway Car Institute

Locomotives (new and rebuilt)

DELIVERED	**1984**	**1983**
September	22	37
August	59	22
Nine months	365	195

BACKLOG	**1984**	**1983**
October 1	207	158
September 1	225	157
Average	170	120

Source: Transportation Div., AAR

Facilities

California Transportation Commission: Approved the following funding for rail projects in the San Francisco Bay Area: $17.59 million for Santa Clara County's Guadalupe Corridor light rail system; $5.144 million for Peninsula Commute Service station improvements; $10.7 million for Bay Area Rapid Transit improvements related to increasing capacity; and $2.8 million for the San Francisco Muni for rehabilitation and extensions of trolley overhead lines and for final engineering and construction of a streetcar line extension on Market Street.

Chessie System: Is spending $3.35 million to construct an automobile loading facility adjacent to the Walbridge Yard in Toledo, Ohio. The ramp, which will have the capability of handling over 1,000 vehicles at a time, is scheduled to be fully operational by Dec. 31.

CN Rail: Entered into a multi-million-dollar contract with Blast Cleaning Products, Ltd., of Oakville, Ont., for the engineering, supply and installation of a microprocessor-controlled blast cleaning facility at Transcona yards, Winnipeg, Man. The new facility will include robotic interior and exterior blast systems. Plans are under way for an automated painting facility to complement the blast cleaning system.

Metropolitan Atlanta Rapid Transit Authority: General Railway Signal is the apparent low bidder on a $14.7-million contract to supply switch machines, signals, train stops and train control equipment for a 7.7-mile extension of MARTA's North and South lines. Completion is scheduled for early 1988.

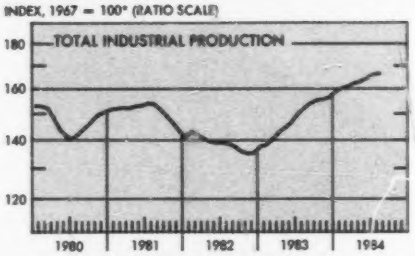
Market Indicators

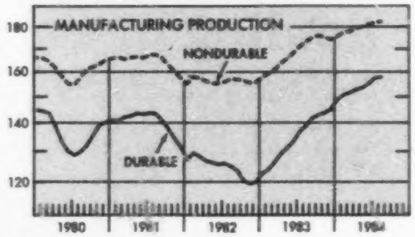
Revenue freight carloadings

Commodity	Oct. 13 week	% change from 1983	Oct. 6 week	% change from 1983	Sept. 29 week	% change from 1983	Sept. 22 week	% change from 1983
Grain	23,984	(26.3)	27,087	(23.0)	27,740	(3.3)	30,333	1.7
Other farm products	4,375	(28.5)	3,731	(2.6)	3,224	(18.0)	3,506	(11.7)
Metallic ores	20,406	19.1	18,094	11.9	18,350	14.9	20,379	52.4
Coal	97,940	(10.8)	108,519	(0.9)	135,321	22.6	136,531	24.8
Crushed stone, gravel and sand	13,724	13.9	13,857	17.3	13,755	15.9	13,306	14.3
Nonmetallic minerals	11,473	(18.5)	12,253	7.2	11,551	(12.7)	12,502	(4.8)
Grain mill products	10,431	(13.1)	10,484	(11.9)	10,188	(21.1)	10,809	(14.6)
Food and kindred products	11,129	(9.1)	11,156	(8.4)	11,456	(11.6)	11,290	(10.2)
Primary forest products	12,936	(11.0	13,946	(4.5)	14,173	(7.8)	14,393	(0.6)
Lumber and wood products (except furniture)	7,051	(3.8)	7,060	0.9	7,848	0.8	7,492	2.2
Pulp, paper and allied products	14,544	1.5	15,088	(1.2)	15,610	(3.3)	14,991	(3.4)
Chemicals and allied products	24,461	0.3	24,349	(2.0)	24,908	(8.5)	25,955	5.0
Petroleum products	4,897	7.9	4,775	1.3	4,636	(2.2)	4,947	0.9
Stone, clay and glass products	11,422	(0.7)	11,744	(0.5)	11,646	(4.8)	12,139	2.6
Coke	5,346	12.7	5,047	3.1	5,242	0.1	4,681	(12.8)
Metals and products	7,969	(9.5)	8,459	3.7	9,453	(2.8)	8,288	(3.5)
Motor vehicles and equipment	20,257	4.4	20,233	2.5	19,489	(0.3)	17,478	(7.9)
Waste and scrap material	9,214	(0.3)	8,908	0.2	9,533	1.5	9,672	7.3
Forwarder and shipper assn. traffic	7,932	(8.9)	7,867	(12.9)	7,562	(19.4)	7,250	(17.6)
All other carloads	61,267	8.7	63,759	8.2	63,627	6.0	61,824	6.8
LCL traffic	179	(45.1)	197	(36.7)	210	(37.7)	170	(50.3)
Total Cars Loaded	**380,937**	**(4.8)**	**396,615**	**(0.9)**	**425,522**	**4.5**	**427,936**	**8.5**

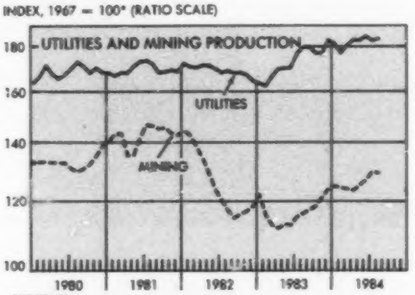
Estimated revenue ton-miles (billions)	1984	1983	% change from 1983
41 weeks	737.1	648.8	13.6

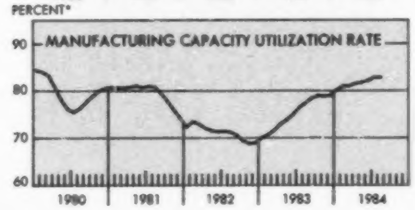
Industrial production and capacity utilization





*SEASONALLY ADJUSTED
SOURCE: BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM





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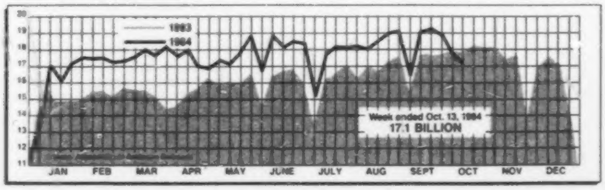
Piggyback loadings

Week ended	Cars loaded 1984	% increase from 1983	Trailers/ containers 1984	% increase from 1983
September 15	55,589	11.4	93,137	5.9
September 22	55,351	8.7	93,614	4.9
September 29	57,324	9.8	98,624	6.8
October 6	58,305	14.8	96,572	7.9
Cumulative total,				
40 weeks	2,045,357	15.1	3,518,124	14.2

Rail freight traffic trends

Billion ton miles (Estimated)



Rate of return reaches 5.5% as earnings soar

With their high fixed costs, railroads can carry a considerable amount of additional traffic without a corresponding increase in expenses. That is what happened in this year's first half. On the strength of a 16% increase in revenue ton-miles, operating revenues rose by more than $2 billion; but expenses increased by less than $1 billion. As a result, the railroads in this year's first six months posted net railway operating income of $1.332 billion, which brought the rate of return for the 12 months ended June 30 to 5.5%. This compared with an NROI of $773 million for the first half of 1983. Ordinary (net) income for the first half of '84 was $1.402 billion, up from $657 million a year earlier. (Ordinary income is calculated after income from non-railroad operations is added and interest on debt and other fixed charges are deducted.)

The first-half figures that were announced by the Association of American Railroads early in October are based on depreciation accounting, a change mandated by the Interstate Commerce Commission during 1983. Under depreciation accounting, certain track expenditures formerly charged to operating expenses are now charged as capital outlays.

In releasing the first-half report, Dr. Harvey A. Levine, the AAR's vice president of economics and finance, cautioned that the accounting change makes year-to-year comparisons on some financial data misleading. "Although we are able to compare net railway operating income and ordinary income, the accounting change makes it impossible to compare net revenue from operations and rate of return on net investment," he said.

Dr. Levine said most of the increase in both ordinary and operating income resulted from "the end of the recession."

Class I railroads in the United States

For the Second Quarter

	1984 (millions)	1983 (millions)
Operating Revenues	$7,545.1	$6,507.8
Operating Expenses	6,471.3	6,146.7
Net Revenue from Operations		
United States	1,073.8	366.1
Eastern District	382.8	95.9
Southern District	230.6	80.4
Western District	460.3	184.8
Ordinary Income		
United States	809.4	495.0*
Eastern District	338.7	205.0*
Southern District	152.3	108.0*
Western District	318.4	182.0*

For the First Six Months

	1984 (millions)	1983 (millions)
Operating Revenues	$14,996.0	$12,883.5
Operating Expenses	13,090.5	12,152.4
Net Revenue from Operations		
United States	$1,905.4	$731.1
Eastern District	577.0	118.1
Southern District	456.7	202.7
Western District	871.8	410.3
Rate of Return on Net Investment[1]	5.5%	Not Comparable
Ordinary Income		
United States	1,402.0	657.0*
Eastern District	510.2	212.0*
Southern District	294.6	171.0*
Western District	597.2	274.0*

[1] Rate of return for 12 months ended June 30 (preliminary)

Due to a change in accounting methods, figures for operating expenses, net revenue from operations and rate of return on net investment are not comparable between 1984 and 1983.

*Restated under depreciation accounting.

Source: AAR

Rio Grande: The bidding begins

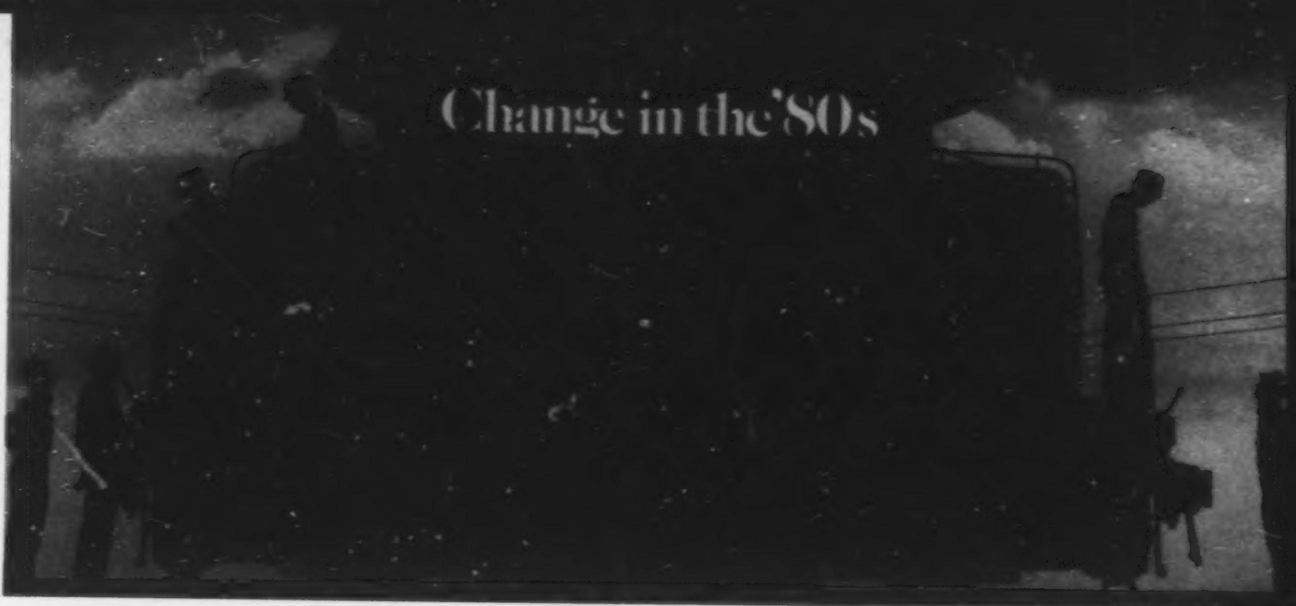
Denver & Rio Grande Western has long been a fascinating railroad, well-managed and profitable despite the handicaps imposed by its rugged Rocky Mountain route and by its substantial dependence upon interline connections and bridge traffic. Industry observers have long wondered who would wind up with D&RGW, in the reshaping of western railroading.

But as the western map was being redrawn, Rio Grande stayed as it was.

Today, it is the only "independent" of any size west of the mid-continent area. It has grown, with its extension to the Missouri River. But it was bypassed in the western merger movement, as nobody seemed quite able to figure out what Rio Grande could provide that couldn't be provided some other way.

So, analysts should not have been surprised when the first bid for Rio Grande came not from a railroad but from an outsider, Anschutz Corp., a closely-held, Denver-based energy company. The price: $50 per share, or $496.5 million. Anschutz began a tender offer Oct. 1, under an initial Oct. 29 expiration date, with the tender of 51% of Rio Grande Industries' shares required for successful completion of the offer.

Change in the '80s


Roy Blanchard

The search for productivity

Without a more productive labor force, railroads are doomed to play a diminishing role on the transportation scene.

By GUS WELTY, Senior Editor

Profit is not a measure of productivity.

Profit is a measure of the gap between what a business takes in and what it costs to run that business. Profit does not measure the competitiveness of a business, and it certainly does not measure the ability of that business to grow, especially when growth depends heavily upon the ability to increase market share.

By the standards of past years, railroad profits in 1984 have been huge. Rail labor unions like the numbers, because they're in negotiation. Some shippers like the numbers, because they see profit-improvement as another arrow to shoot at deregulation. And some in rail management seem almost embarrassed by the profit-numbers they're reporting.

All of the above are thinking wrong thoughts.

The 1984 profits are a reflection of two things. The main factor is the economic recovery itself. The other factor is the modest improvement in productivity which railroads have been able to make, and the leverage that results from an industry's having its equipment and plant in A-1 shape.

But economic recoveries inevitably lead to economic recessions. And the battle for productivity improvement is one that has to be fought on all fronts, continuously, because railroads are dealing in a fragile market with revenues and profits that are extremely fragile and with transportation competitors who are intent upon improving their own productivity.

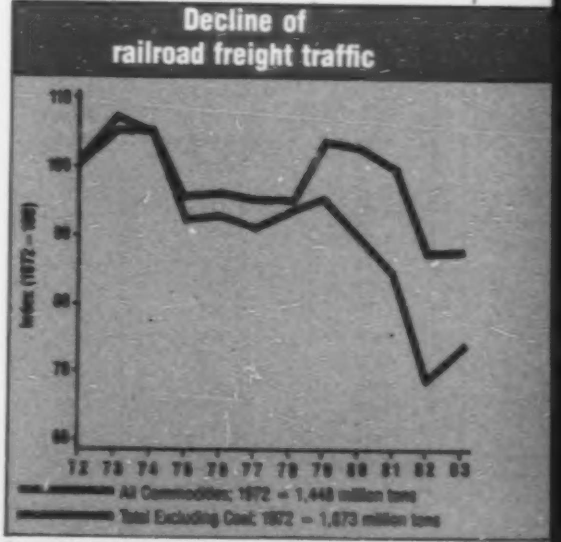
Productivity improvement means improvement in the use of physical assets, equipment and plant. It also means improvement in the use of people.

With the help of the railway supply industry, railroads have been able to do great things on the physical-asset side. In just the past 10 years, there have been tremendous advances in everything from locomotive reliability and fuel efficiency, to track renewal techniques, to the development of more sophisticated communications and signal gear, to the introduction of more cost-effective freight cars and components, to the adaptation of computers for more and more railroad applications, and on and on and on.

Technology, the improvement in asset-utilization, has been particularly important in the transportation of coal and of highway trailers and containers, the railroads' two highest-volume commodities.

It does not stretch a point to say that technology has gone a long way toward saving the industry, helping it mightily during bad times and making it look even better during good times.

Productivity improvement through technology will continue. The challenge, now, is productivity improvement on the people side.


Decline of railroad freight traffic

Source: ICC, *Freight Commodity Statistics, Class I Railroads.*

Change

Decline in railroad market share

Relative Distribution of Revenues: Intercity Freight Carriers

Year	Railroads	Trucks	Oil Pipelines	Others
1972	37.5%	51.9%	3.7%	6.9%
1973	36.8	52.2	3.6	7.4
1974	38.0	50.9	3.6	7.5
1975	37.8	50.2	4.3	7.7
1976	36.9	51.8	4.3	7.0
1977	34.6	53.1	4.8	7.5
1978	32.0	53.9	7.2	6.9
1979	31.8	53.7	7.3	7.2
1980	33.2	52.0	7.7	7.1
1981	33.2	51.9	7.4	7.5
1982	31.8	52.6	8.3	7.3

Source: *Transportation Facts and Trends*, Transportation Association of America, and *Transportation in America*, Transportation Policy Association.

That's where the going gets tough.

By the quick and easy measures, people-productivity has improved by quite a bit. Rail freight traffic is up, and many measures of operating performance are up, while employment is down. The conclusion, some argue, is obvious: People-productivity has gone up tremendously.

The conclusion may be "obvious," but it also is off the mark.

Railroad productivity improvements have been due primarily to capital investment, the substitution of capital for labor in an industry that has been both capital- and labor-intensive.

In almost every year for the past two decades, railroad capital expenditures have exceeded retained capital. For six years in a row, 1975-80, investment exceeded retained funds by more than $1 billion, and in 1978 the gap was more than $2 billion.

Those are the kinds of numbers that make financial analysts nervous. But if railroads were to stay in business and try, somehow, to stake out a claim on the future, the investments were a gamble that had to be taken. The replacement of labor by capital was really the only choice the railroads could have made, in view of rail labor's siege-mentality response in just about every negotiating session that involved change.

Nobody who was around then can forget how long it took to get a final agreement on the phasing-out of the locomotive fireman in freight and yard service, years after the diesel-electric locomotive replaced the steam locomotive. Nobody now around, probably, will be able to forget how long it will take to phase-out the caboose, even now that end-of-train and wayside detection and monitoring devices can do, probably better, the jobs that once required a human presence at the rear of a train.

And, of course, nobody can ever not note that the railroads, almost alone among basic industries, have to deal with more than a dozen individual unions, each jealous of its position and none willing to take a first step toward change except under the duress of public and governmental pressure.

Decline in "real" (constant dollar) railroad freight revenue per ton-mile

Year	Freight Revenue Per Ton-Mile in Current Dollars (cents)	Railroad Inflation	Freight Revenue Per Ton-Mile in Constant Dollars (cents)	Index
1972	1.618¢	100.0	1.618¢	100
1973	1.617	112.3	1.440	89
1974	1.853	128.3	1.444	89
1975	2.041	146.0	1.398	86
1976	2.191	161.7	1.355	84
1977	2.286	175.4	1.303	81
1978	2.358	190.3	1.239	77
1979	2.599	214.2	1.213	75
1980	2.852	245.7	1.161	72
1981	3.178	276.6	1.149	71
1982	3.212	295.2	1.088	67
1983	3.125	307.8	1.015	63

Source: Annual Reports of Class I Railroads (R-1); "Series QMPW" from 1972 to 1977 and the "Railroad Cost Recovery Index" from 1977 to 1982 (both series are constructed by the Association of American Railroads).

With few exceptions, rail labor has never regarded itself as anything but an antagonist in its relationship to rail management. And that historic antagonism is what may hurt both sides the most, as the industry continues its must-do search for more ways to improve productivity in competition with other transportation modes that, increasingly, are either non-union or benefitting from union concessions.

Here, you cannot ignore barge competition. Barges have lower labor costs. Barges eat into rail movement of export grain and coal, and there is even a container-barge operation working the Chicago/Gulf Coast market.

But it's in the rail-vs-highway market where railroads are going head-to-head with the competition on a day-to-day basis. And it's in this market where the battle for future prosperity, and maybe even for survival, will be fought.

Railroads do not go into that fight with a lot of reasons for optimism.

In the 50 years between 1925 and 1975, for example, the railroad share of the intercity freight market dropped from 80% to less than 37%, which is about where it is today. What's more important than that decline, however, is the fact that the rail share of intercity freight revenues has gone down from 31.6% in 1960 to 17.9% last year, while the motor carriers' revenue share was going up from 62.9% to 72.5%. The rail share of revenues, in fact, has fallen by almost three percentage points, 20.8% to 17.9%, since 1981, after the partial deregulation brought about by the Staggers Act. Or, to look at it another way, total U.S. freight tonnage has increased by 41.5% over the past 23 years, but railroad tonnage climbed by only 5.8%, and since

1970 railroads have been able to bring home less than 10% of the net growth in intercity freight revenues.

What went wrong? One thing that went wrong was the government's promotion of an interstate highway system that in many cases duplicated railroad routes and did not provide for anything resembling adequate user charges for the trucks that went blazing across the new highways. Another factor was the 1980 motor carrier act that deregulated most trucking activity and almost eliminated entry restrictions. Today, there are about 100,000 owner-operators out there trying to get what is mostly rail-competitive freight. And the number of certificated motor carriers has gone up by about 74%. Non-union companies have come into the business, unionized companies have gone the "double-breasted" route by setting up non-union subsidiaries, and the Teamsters have made concessions in bargaining with unionized truckers.

In the meantime, over the past 10 years, increases in railroad labor compensation have been 53% greater than increases in that part of the motor-carrier industry that is unionized.

Something like 70% of rail freight revenues are susceptible to diversion to truck. But railroad pricing people have been blitzed: Labor costs have gone up far more than productivity has gone up, and so there have been upward pressures on rail freight rates because no railroad is currently revenue-adequate by Interstate Commerce Commission standards and so cost increases simply cannot be absorbed without revenue increases.

But what happens when a railroad raises rates? The business goes somewhere else. Case in point: One railroad, known for fast and reliable piggyback service, tried to improve its thin margins by making a modest rate increase. What happened? TOFC/COFC traffic in its territory continued to grow, but its volume remained flat, while the growth went to other railroads and/or back to the highways. That railroad has, at least, the consolation that its intermodal business is making a somewhat improved contribution. But long-term growth has not been enhanced, not as it could be if productivity improvements could be obtained.

Productivity improvements? For that, you could read employment-opportunity enhancement.

In 1947, railroads had 1.3 million employees on the payroll. In 1980, the number was 500,000. The most recent figure is 330,000. Employment in the trucking industry has gone up by about 40% in the past 25 years, but railroads have been forced to substitute productivity improvements from capital for productivity improvements from people.

Why? Look at some of the numbers.

—For railroad employees, average annual compensation is greater than the compensation of 97% of the rest of the U.S. work force.

—In the 1972-1983 period, the Consumer Price Index rose by 137%, while railroad labor compensation went up by 204%.

—Last year, the average annual compensation, including fringe benefits, for a railroad employee was $40,972. That was 53% more than employees in the motor-carrier industry received.

—Just since 1980, average annual railroad-employee compensation has gone up by more than $10,000. Average annual compensation in the trucking business increased by less than half that much.

—Between March 1981 and April of this year, rail wages rode a 26.7% updraft. The increase during the same period for the motor carriers was 7.9%.

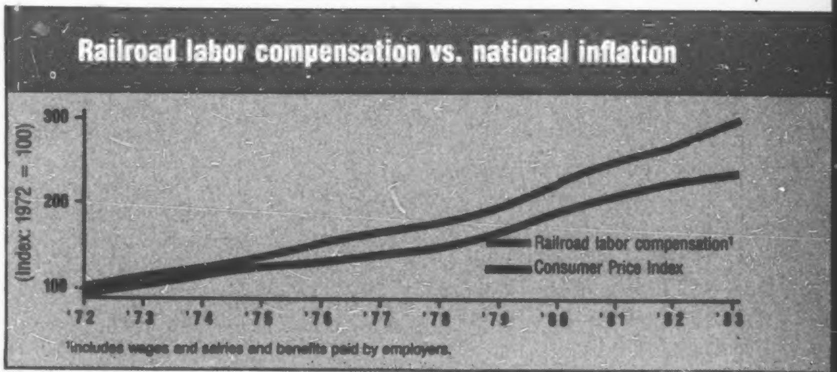
Are shippers complaining about rail freight-rate increases? Some of them are. But 75% of the increases taken in rates since late 1980 have been due to increases in employee compensation which were locked in by negotiated agreements.

And it is not just employee-compensation costs that are crippling what might otherwise be a successful attempt by an old-line industry to bootstrap its way into the 20th Century and toward the 21st.

Total factor railroad productivity
(Index: 1972 = 100)

Year	Total Factor Productivity	Annual Percent Change
1972	100.0	—
1973	103.6	+3.6%
1974	105.8	+2.1
1975	98.8	−6.6
1976	104.5	+5.8
1977	104.7	+0.2
1978	109.2	+4.3
1979	106.0	−3.0
1980	109.0	+2.8
1981	110.8	+1.7
1982	114.3	+3.2
ANNUAL AVERAGE CHANGE		+1.4%

Source: *Multiple Input Productivity Indexes*, American Productivity Center.



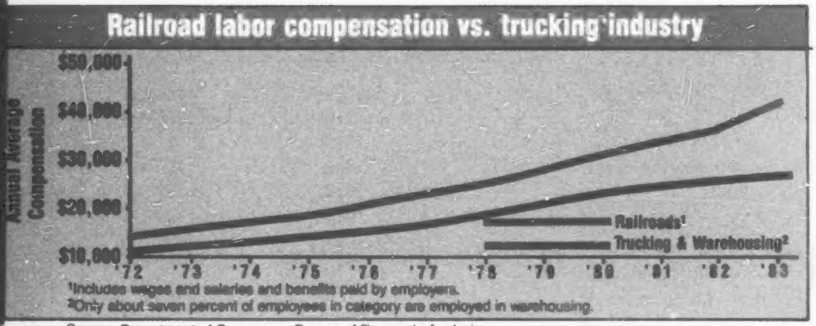
Railroad labor compensation vs. national inflation

[1]Includes wages and salries and benefits paid by employers.

Source: Railroad labor compensation from AAR Railroad Cost Recovery Index;
CPI from Department of Labor, Bureau of Labor Statistics, and;
IPD from Department of Commerce, Bureau of Economic Analysis.

Change

Railroad labor compensation vs. trucking industry



¹Includes wages and salaries and benefits paid by employers.
²Only about seven percent of employees in category are employed in warehousing.

Source: Department of Commerce, Bureau of Economic Analysis.

There are the arbitraries, the road-yard restrictions, the division-of-work limits, and the hoary 100-mile "basic day" which came into being when a train, with some good luck, might average 12.5 mph over eight hours for a 100-mile day. But every attempt that rail management has made to update its labor agreements, especially with the operating crafts, has hit a stone wall.

The crafts have been willing, in a modest way, to "experiment" with changes in crew consist and in other work rules, in cases where everybody involved was protected and where "new" business was involved.

Labor's willingness to participate should be praised. But "new" business is not the only stake that management or labor has to push onto the table. There is, of course, existing business, that can so easily be lost when somebody else gets more efficient and can offer a lower rate. There is also the lost opportunity even to go out and get new business: With partial deregulation, railroads can make contracts and they can make rates quickly, but if the price has to involve a labor-saving, then the opportunity may be lost because of the time it sometimes takes to convince rail labor's leaders that opportunity matters.

Where does a solution lie? Unfortunately, there is no apparent solution, as matters stand.

Today, rail labor has a perceived advantage. It negotiated the current agreements during times when railroad fortunes were decent. It is negotiating today when railroad fortunes are perceived as being far better. Rail labor holds the ace. And, with more than a dozen unions involved and with intra-union and inter-union controversies unresolved, the outlook is not good.

Railroad negotiators can talk about the need for improved productivity, about the need for reduced unit costs of service, about the need for reliability and flexibility in service, about the need for buisness growth and improvement in market share until their faces turn blue.

The fact remains that while rail labor unions have been willing to make those "experimental" changes, they show no inclination whatsoever to make the kinds of basic changes that would strengthen the railroad industry, make it more competitive, and thus preserve and protect and maybe even increase job opportunities.

Railroads can talk a lot about the inherent advantages of the steel wheel on the steel rail, and about how much more fuel-efficient railroads are, and about what railroads can do to gain business and increase market-share under deregulation if just they had the chance.

What railroads mean is that they can't have this chance if they don't have a cost-break as regards their competition because, face it, if a customer wants absolute flexibility in service he's going to go truck.

There are, at last report from the ICC, about 330,000 railroad employees, which is far fewer active employees than there are retirees.

And railroads will continue to make heavy capital investments to improve productivity. They have no other choice, if they're going to stay in the railroad business, and those capital expenditures will inevitably result in further declines in railroad employment.

There are 330,000 railroad employees now? By one estimate, with the technology now available, fully applied, about 100,000 employees could do the job, and handle reasonable growth.

One labor leader, outside the railroad industry, has been quoted as saying that the only real job security lies in having a job.

And so, in a real way, it's rail labor's choice.

The real problem is that a nation depends upon railroads. Real productivity in manufacturing, real productivity in distribution, real productivity in the generation of electricity, real productivity in a lot of areas depends upon railroads.

Railroads have gotten a lot of their improved productivity out of capital, not a whole lot out of labor.

Tomorrow, it's going to take two, capital and labor. Working, for a change, together.

Will it work? If it doesn't, nothing else will. ■

Cost of borrowing money

Year	Prime Interest Rate	Index
1972	5.25%	100
1973	8.02	153
1974	10.80	206
1975	7.86	150
1976	6.84	130
1977	6.82	130
1978	9.06	173
1979	12.67	241
1980	15.27	291
1981	18.87	359
1982	14.86	283
1983	10.79	206

Source: Data Resources, Inc., *U.S. Long-Term Review*, Winter 1983-84, and Council of Economic Advisors, *Economic Indicators*, June 1984.

1984

RAILWAY AGE

railways

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Change in the '80s

A thoroughbred on the move

SPECIAL REPORT: OUTLOOK '85

RAILWAY AGE

...for the new age of railways

RAILWAY AGE
A thoroughbred on the move

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A thoroughbred on the move

Innovation-minded Norfolk Southern is active on many fronts as it seeks to protect and enhance its position in a fast-changing transportation scene.

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A pivotal year shapes up

The national economy, labor negotiations, and the anticipated battle in Congress over deregulation could have major impacts on the railroad industry next year.

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Change—and challenge

On balance, 1984 brought good fortune to the railroad industry. Traffic and earnings were up, and deregulation was working. But many problems remained.

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"A national disaster"

According to ICG Chairman Harry Bruce, if deregulation foes succeed in "putting the genie back into the bottle," it would not just be an industry disaster.

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studies AFC

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brightens Buffalo

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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014 USPS 449-130, Vol. 185, No. 12

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years; all other countries [illegible] one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies [illegible] plus postage and handling, except special issues. Copyrighted © 1984.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.

Printed at Hughes Printing Co., [illegible] North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT. 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

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Inside

A capital year—for some

LUTHER S. MILLER

What does it cost, in capital-outlay dollars, to keep a first-class railroad in first-class condition? Around $35,000 to $40,000 a route mile, the way we figure it, based on the evidence at hand.

To be more specific: Norfolk Southern, traditionally a heavy capital spender, will carry on in the old tradition in 1985 by investing around $39,275 a route mile. Santa Fe will invest $38,800 a mile, Conrail $37,000, and the CSX roads $34,000. Respectable figures all—and all of them representing substantial increases over 1984.

The '85 budgets add up to good news for suppliers in the track field, which again is getting the biggest share of investment dollars. On the equipment side, there's good news for locomotive builders; although most railroads have a big surplus of old diesel-electrics stored in serviceable condition, they are fast getting in line to buy the newer models that have been put onto the market by Electro-Motive and General Electric, simply because the new units are so much more efficient that railroads feel they can't afford *not* to buy them.

The new capital budgets provide for few, if any, new revenue cars. The picture is not really all that bleak, though. The activity in freight cars these days is coming mainly from utilities and private car lines—activity that is not reflected in railroad capital budgets—and the American Railway Car Institute is predicting an increase in both new orders and deliveries in 1985, though business will still fall far short of the halcyon days of the '70s.

Railroad and railroad-supplier prospects for the new year are covered in Senior Editor Gus Welty's '85 Outlook piece that starts on p. 35.

Behind the scenes at Norfolk Southern

As indicated above, Norfolk Southern has so far emerged as the biggest capital spender of them all, mile for mile. Norfolk Southern's $714.4-million capital program is more than $200 million in excess of its 1984 program, and it provides new evidence of this efficiency-driven company's dedication to harnessing the latest available technology in a relentless effort to keep costs down and quality up. But a lot is going on at Norfolk Southern that is not reflected in stories that appear in the press about next year's capital budget or other newsworthy enterprises the company is engaged in—like buying a truck line or trying to buy Conrail. An account of some activities that Northern Southern is quietly engaged in that might be making tomorrow's transportation headlines is part of our cover story (p. 31)—another in our series of articles on Change in the '80s.

Market Outlook

Freight cars

DELIVERED

	October 1984	October 1983	September 1984	Ten months 1984	Ten months 1983
Built new by carbuilders	1,295	736	1,465	10,375	4,210
Built new in RR shops	0	0	0	0	202
Built new—total	1,295	736	1,465	10,375	4,412
Rebuilt	0	0	0	0	100
TOTAL DELIVERED	**1,295**	**736**	**1,465**	**10,375**	**4,512**

ORDERED

	October 1984	October 1983	September 1984	Ten months 1984	Ten months 1983
To be built new by carbuilders	1,422	642	775	13,778	4,806
To be built new in RR shops	156	0	0	406	2
To be built new—total	1,578	642	775	14,184	4,808
To be rebuilt	0	0	0	0	100
TOTAL ORDERED	**1,578**	**642**	**775**	**14,184**	**4,908**

ON ORDER AND UNDELIVERED

	Nov. 1 1984	Nov. 1 1983	Oct. 1 1984	Average Backlog 1984	Average Backlog 1983
To be built new by carbuilders	5,493	3,368	5,366	6,209	4,050
To be built new in RR shops	406	0	250	141	28
To be built new—total	5,899	3,368	5,616	6,350	4,078
To be rebuilt	0	0	0	0	27
TOTAL ON ORDER	**5,899**	**3,368**	**5,616**	**6,350**	**4,105**

Orders, Deliveries and Backlog Include Estimates for Tank Cars
Source: Transportation Div., AAR, and the American Railway Car Institute

Locomotives (new and rebuilt)

DELIVERED	1984	1983
October	35	43
September	22	37
Ten months	400	198

BACKLOG	1984	1983
November 1	189	128
October 1	207	158
Average	172	121

Source: Transportation Div., AAR

Equipment

Amtrak: Ordered 10 new 3,000-hp F-40PH diesel-electric locomotives from the Electro-Motive Division of General Motors at a cost of $13.4 million.

BC Rail: Ordered five SD40-2 locomotives from the Electro-Motive Division of General Motors for May 1985 delivery, at a cost of $6.8 million (Canadian). The units will sport the same red white and blue as the railway's new electric locomotives, also supplied by EMD, instead of the traditional shades of green.

Conrail: Placed orders for 50 additional diesel-electric units—25 3,600-hp SD-50 units from Electro-Motive Division of General Motors, valued at $32.5 million, and 25 3,750-hp C36-7 units from General Electric, also valued at $32.5 million.

- Conrail is acquiring 650 45-foot-long, 102-inch wide piggyback trailers valued at $9 million. Earlier this year, the railroad spent $3.4 million to lengthen 1,500 trailers from 40 feet to 45 feet.

Norfolk Southern: Plans to acquire 140 ballast cars in 1985. They will be similar to 126 cars with Morrison-Knudsen doors purchased this year.

Ortner Freight Car Co.: Received two new-car orders valued at $21.9 million. Ortner will supply 150 flatcars to the U.S. Army for $12.8 million, and 253 lightweight steel gondola cars to Wisconsin Electric Power Co. for $9.1 million. Both orders are scheduled for mid-1985 delivery.

Pullman Leasing: Ordered 200 covered hopper cars with 5,820-foot capacity from the Pullman Standard Manufacturing Division of Trinity Industries. Designed for plastics resin service according to specifications of the Chemical Manufacturers Association, the cars are to be delivered in first-quarter 1985. They'll feature the latest version of Pullman Leasing's Micromatic 7 gate, designed for a continuously variable range of product flow.

Toronto Transit Commission: Ordered 126 new rapid transit cars and 52 articulated light rail cars, valued at a toal of $282 million (Canadian), from Can Car Rail Inc. (details p. 67).

Union Pacific System: Is acquiring Trainlink end-of-train monitors from Pulse Electronics, 30 for Union Pacific Railroad and 65 for Missouri Pacific. Union Pacific System foresees operation of 95 cabooseless trains in the near future, following a recent ruling by a federal labor arbitrator.

Facilities

Chessie System Railroad: Will spend $9.8 million for a new intermodal terminal at East St. Louis, to be built in two phases. The first, scheduled to be in operation by third quarter 1985, includes two tracks each handling 30 cars under a 70-foot overhead crane, and two 15-car tracks for sideloading. The second, scheduled for 1988, will include more cranes, car spots and parking. Part of existing Chessie and Seaboard yards, the new piggyback terminals will be able to handle new-generation trailers and railcars.

Market Indicators

Investment trends

A dramatic shift in railroad capital-investment emphasis is illustrated in the accompanying table. It shows that investment in roadway and structures, which for many years accounted for about one-third of capital outlays, is now absorbing well over two-thirds—a trend that is continuing in 1984 and is expected to continue in 1985, though it will not be as pronounced as in 1983 when rolling stock expenditures dropped to a rock-bottom $451 million. (Rolling stock includes cars, locomotives and cabooses. Roadway includes terminals, track, bridges and structures, classification yards and port terminals.)

Railroad Capital Expenditures
(Millions of Dollars)

Year	Total Capital Expenditures (millions $)	Rolling Stock (millions $ (a))	Rolling Stock % of Total	Roadway & Structures (millions $ (a))	Roadway & Structures % of Total
1973	$1,392	$952	68.5	$440	31.5
1974	[illegible]	[illegible]	[illegible]	507	29.7
1975	[illegible]	[illegible]	72.8	485	27.2
1976	[illegible]	1,175	[illegible]	[illegible]	21.9
1977	[illegible]	[illegible]	67.2	751	32.8
1978	[illegible]	[illegible]	[illegible]	[illegible]	31.2
1979	[illegible]	[illegible]	[illegible]	[illegible]	31.3
1980	[illegible]	[illegible]	[illegible]	[illegible]	35.2
1981	[illegible]	1,421	[illegible]	1,384	48.7
1982	1,975	713	36.1	1,262	63.9
1983	1,807	451	25.0	1,356	75.0

[illegible]

Revenue freight carloadings

Commodity	Nov. 17 week	% change from 1983	Nov. 10 week	% change from 1983	Nov. 3 week	% change from 1983	Oct. 27 week	% change from 1983	Oct. 20 week	% change from 1983
Grain	31,076	(0.6)	27,416	(7.9)	29,482	(12.3)	24,039	(20.6)	22,819	(24.7)
Other farm products	5,502	36.8	6,770	34.5	5,785	4.5	4,745	(15.6)	4,764	(23.9)
Metallic ores	14,230	(14.1)	16,867	(6.9)	14,554	(22.5)	13,396	(24.4)	13,677	(34.1)
Coal	99,507	(12.6)	105,124	(3.9)	99,399	(12.3)	95,124	(13.1)	94,579	(17.5)
Crushed stone, gravel and sand	12,653	15.3	13,347	19.1	13,399	19.4	13,600	21.2	13,977	23.4
Nonmetallic minerals	10,682	(4.6)	10,989	(2.3)	12,399	6.8	12,212	(8.4)	11,111	(13.3)
Grain mill products	10,161	(3.5)	10,657	2.7	10,730	(2.1)	10,582	(7.4)	10,544	(12.3)
Food and kindred products	10,686	(7.4)	11,210	(1.4)	11,712	(3.4)	11,283	(7.7)	11,176	(9.4)
Primary forest products	13,539	(10.6)	13,502	(10.2)	13,537	(12.3)	13,249	(11.7)	13,134	(11.8)
Lumber and wood products except furniture	7,100	0.2	6,813	(5.0)	7,384	1.0	7,197	(0.7)	7,270	(1.5)
Pulp, paper and allied products	14,111	(4.9)	14,543	(1.3)	15,232	1.4	15,034	0.6	14,442	(4.7)
Chemicals and allied products	23,257	(2.9)	24,177	(1.2)	23,613	(3.7)	23,449	(5.3)	24,114	(2.1)
Petroleum products	4,876	0.2	4,925	5.1	4,518	(7.8)	4,563	(3.8)	4,647	(3.1)
Stone, clay and glass products	10,629	1.4	11,223	(0.1)	11,108	(4.5)	10,875	(7.3)	11,121	(3.8)
Coke	4,812	(11.2)	5,077	0.2	5,392	3.6	4,963	(4.2)	4,904	(0.7)
Metals and products	7,561	(15.0)	8,124	(2.5)	8,792	1.0	7,903	(15.9)	8,004	(9.5)
Motor vehicles and equipment	21,255	5.5	21,587	9.4	20,467	5.1	19,642	(3.1)	20,140	1.7
Waste and scrap materials	8,973	(6.8)	8,430	(9.9)	8,761	(3.2)	8,909	(1.9)	9,487	5.4
Forwarder and shipper assn. traffic	7,524	(12.7)	7,827	(11.1)	7,983	(10.4)	7,980	(11.2)	7,722	(12.2)
All other carloads	59,416	4.9	60,586	8.1	62,850	7.4	62,425	3.8	62,440	6.0
LCL traffic	178	(33.3)	145	(44.4)	193	(35.7)	195	(25.6)	230	(16.4)
Total Cars Loaded	377,887	(4.6)	380,330	(8.8)	387,288	(4.7)	371,346	(8.8)	376,322	(9.6)

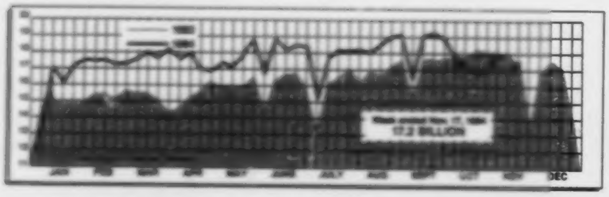
Estimated revenue ton-miles (billions)	1984	1983	% change from 1983
45 weeks	827.6	739.3	11.9

Piggyback loadings

Week ended	Cars loaded 1984	% increase from 1983	Trailers/ containers 1984	% increase from 1983
October 13	56,425	14.6	92,843	7.5
October 20	57,429	12.9	93,461	4.5
October 27	57,122	10.1	94,07*	2.4
November 3	58,654	14.0	98,392	5.7
November 10	57,247	17.8	83,776	8.7
Cumulative total, 45 weeks	2,332,385	14.9	3,987,807	13.1

Rail freight traffic trends

Billion ton miles (Estimated)



**Moving People:
Busy year for builders**

January 1985

RAILWAY AGE

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High-tech railroading

Keeping wheels in shape

RAILWAY AGE

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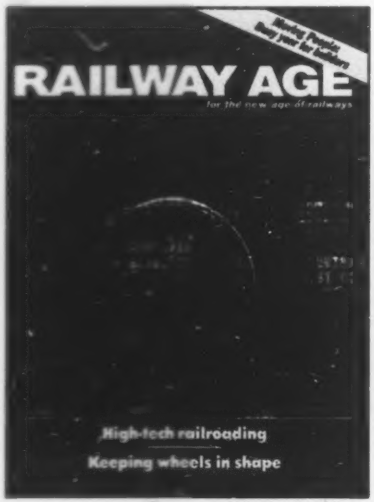

Cover: Photo by Roy Blanchard. *Page 27.*

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Now (or soon to be) working on the railroad are such space-age tools as microchips, laser beams and satellites—and there's more to come.

31 Fiber optics: An inside track

In both on-line communications and bottom-line profits, fiber optics will play a big role in tomorrow's railroads. The only question is how big.

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A GTW line in Lansing, Mich., has become an extension of an Oldsmobile assembly line—or has the auto plant become an extension of the railroad?

39 Keeping wheels in shape

The average railroad wheel endures incredible abuse during its 250,000-mile lifetime. How can the abuse be minimized and wheel-life increased?

56 Moving people: A busy year

Despite the threat of more federal funding cuts, enough rail passenger activity is already under way in the U.S. to keep the wheels turning.

59 For Transit America, a running start

The former Budd Transit Division has a healthy backlog, a new name, and a new game plan for penetrating a greatly expanded marketplace.

Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014 USPS 449-130, Vol. 186, No. 1

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years; all other countries $35 one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies $3 plus postage and handling, except special issues. Copyrighted © 1984.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT. 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

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Inside

Welcome to tomorrow

LUTHER S. MILLER

CP Rail President R.S. Allison told the Canadian Railway Club recently that he foresees the day—perhaps 20 years or so down the road—when a train crew will consist of an engineer sitting in a control module: "In front of him would be a stop and go button. Using computers, the whole system could be programmed with such things as the track profile and the characteristics of the train. Such a train would run automatically from A to B at the most efficient fuel consumption speed, and get to B at the correct time to meet another train."

Far-out? Visionary? Actually, said Mr. Allison, "The technology for all of this exists today, but like everything else, it is likely to develop in an evolutionary fashion. But it's only a matter of time."

The time may be shorter than Mr. Allison thinks. The "evolution" of railroads into a high-tech, space-age industry is starting to look more like a revolution, with the harnessing of microprocessors to locomotives, with the kickoff this year of two major efforts to reach out into space for train control systems, with the appearance of unmanned track machines on the right-of-way—with, in fact, the whole spectrum of high-tech developments that Senior Editor Gus Welty explores in this issue's cover story.

Taken singly, not one of the dozen or more breakthroughs enumerated in this story represents what is known in the journalism trade as "hard news." But taken together, they add up to something awesome. Gus, who has been following railroad developments with an eagle eye for more than 25 years, says: "Even *I* was impressed when I began to add them all up." His story starts on p. 27.

A John Armstrong bonus issue

Associate Editor John H. Armstrong, whose grasp of the technical side of railroading is so complete that when he goes out on an interview he sometimes answers more questions than he asks, is represented in this issue by two stories. One is about a development that is beginning to be of enormous importance to railroads—the science of fiber-optic communications; the other is about something that has been of great importance to the industry for 150 years—wheel-life.

If the lightwave is really the communications wave of the future, John points out, the railroads are on an inside track to take advantage of it (p. 31).

As for wheels, John finds them to be "good soldiers, performing their multiple functions over lifetimes averaging 250,000 miles or so," and he is almost apologetic for being critical of them at all; but he does suggest that there may be ways railroads can get more out of their $550-million annual investment (p. 39).

REVENUES AND EXPENSES OF RAILWAYS

Third quarter figures of calendar year 1984

(Dollar figures are stated in thousands, i.e., with last three digits omitted)

		Operating revenues				Operating expenses												1984		
						Way & structures			Equipment											
		Freight	Other	Total 1984	Total 1983	Total 1984	Total 1983	1984 Deprec.	Total 1984	Total 1983	1984 Deprec.	Total 1984	Total 1983	Operating Ratio 1984	Operating Ratio 1983	Income after fixed charges 1984	Income after fixed charges 1983	Net Ry. operating income	Net income 1984	Net income 1983
Amtrak	3 mos.	—	204,551	204,551	193,444	21,412	37,191	(17,610)	99,641	85,939	20,258	371,878	352,912	181.80	182.43	(158,556)	(181,100)	(167,327)	(158,556)	(181,100)
	9 mos.	—	550,629	550,629	509,349	153,346	113,340	40,892	285,491	264,201	60,274	1,148,691	1,031,295	208.61	202.47	(578,790)	(579,843)	(598,062)	(578,790)	(579,843)
Atchison, Topeka & Santa Fe	3 mos.	579,210	13,262	592,472	553,848	84,885	90,891	12,867	131,197	118,934	23,777	518,213	498,090	87.46	89.93	70,030	56,176	46,907	42,439	38,800
	9 mos.	1,713,623	34,390	1,748,013	1,546,378	254,839	245,835	42,515	405,245	363,161	71,080	1,571,157	1,452,184	89.88	93.90	168,798	82,663	117,899	109,117	59,942
Baltimore & Ohio	3 mos.	250,391	10,205	260,596	234,420	45,955	64,697	9,885	56,877	49,567	7,317	247,746	241,161	95.06	102.87	9,394	(7,503)	17,620	8,130	3,650
	9 mos.	776,651	31,214	807,865	661,132	136,860	165,059	29,615	175,009	159,482	21,834	750,228	689,114	92.86	104.23	51,805	(19,048)	9,722	37,892	(12,546)
Bessemer & Lake Erie	3 mos.	18,253	6,975	25,228	18,252	4,867	4,077	1,384	4,025	2,220	1,020	18,855	15,565	74.73	85.27	6,983	3,047	3,593	4,215	1,706
	9 mos.	48,230	15,705	63,935	48,462	12,295	9,721	4,082	7,632	6,142	3,160	51,622	45,011	80.74	92.87	13,552	4,109	7,039	8,292	2,416
Boston & Maine	3 mos.	30,542	1,661	32,203	—	4,428	—	393	9,149	—	54	28,945	—	89.88	—	3,769	—	3,332	3,769	—
	9 mos.	90,697	4,611	95,308	—	13,294	—	1,188	28,000	—	162	88,519	—	92.87	—	8,011	—	7,012	8,011	—
Burlington Northern	3 mos.	1,088,995	21,335	1,110,330	1,041,289	151,765	239,806	40,306	188,402	177,445	15,222	844,332	888,965	76.04	85.37	254,520	155,913	156,796	145,308	88,304
	9 mos.	3,261,538	68,590	3,330,128	2,977,997	456,711	615,725	117,093	585,070	531,178	46,402	2,612,176	2,597,678	78.44	87.22	730,876	355,164	409,606	422,500	206,807
Chesapeake & Ohio	3 mos.	282,621	12,246	294,867	247,063	34,531	59,843	8,090	61,192	52,306	3,834	227,742	233,637	77.23	94.56	89,160	11,939	37,128	89,154	4,619
	9 mos.	816,106	30,300	846,406	705,930	107,835	150,450	24,195	184,155	155,246	10,870	696,813	654,392	82.32	92.69	204,001	37,627	85,703	140,132	19,864
Chicago & North Western	3 mos.	194,509	26,572	221,081	234,537	27,814	50,119	5,119	53,874	55,106	4,448	195,904	222,606	88.61	94.91	20,300	3,167	22,558	17,675	3,167
	9 mos.	598,238	78,243	676,481	640,393	96,236	121,561	16,512	162,193	151,736	13,310	620,290	612,014	91.69	95.56	35,629	10,703	51,403	30,854	10,703
Chicago, Milwaukee, St. Paul & Pac.	3 mos.	104,615	3,439	108,054	93,882	19,471	17,880	5,916	29,073	26,734	3,083	104,088	96,824	96.33	103.13	6,776	(1,835)	4,067	4,824	(1,182)
	9 mos.	312,808	11,021	323,829	270,466	61,052	52,752	17,723	91,779	75,675	9,098	316,108	275,216	97.61	101.75	12,712	(22,178)	7,753	11,761	2,482
Conrail	3 mos.	795,897	31,814	827,711	747,370	116,680	159,215	20,843	185,356	180,841	35,876	692,901	716,036	83.71	95.80	140,835	30,557	127,140	140,835	35,600
	9 mos.	2,445,362	93,913	2,539,275	2,231,600	364,022	448,104	63,754	569,381	548,701	106,794	2,145,686	2,148,301	84.49	96.26	410,644	73,461	371,221	410,644	90,292
Delaware & Hudson	3 mos.	30,321	1,089	32,010	29,012	5,519	5,536	213	10,394	7,806	161	32,442	29,171	101.34	100.54	(706)	(2,972)	(411)	(706)	(2,972)
	9 mos.	89,061	5,164	94,225	81,026	15,997	15,036	614	28,620	23,623	579	95,754	84,855	101.62	104.72	(2,797)	(11,911)	(1,450)	(2,797)	(11,911)
Denver & Rio Grande Western	3 mos.	90,262	1,361	91,623	80,140	13,840	13,440	4,112	17,411	16,938	3,117	80,846	75,479	88.23	94.18	10,583	3,664	7,645	7,331	2,861
	9 mos.	268,950	4,134	273,084	226,088	42,386	36,422	9,827	52,457	47,807	9,338	245,584	213,828	89.92	94.57	25,704	10,872	19,530	17,365	16,884
Duluth, Missabe & Iron Range	3 mos.	22,441	870	23,311	23,411	9,184	6,564	1,561	3,437	2,196	671	21,267	16,780	91.23	71.67	4,872	7,111	671	3,642	3,730
	9 mos.	61,914	2,911	64,825	56,267	24,002	17,253	4,703	8,557	6,509	2,078	61,606	47,257	95.03	83.98	9,749	10,378	(2,134)	5,686	5,885
Elgin, Joliet & Eastern	3 mos.	11,973	5,858	17,831	22,363	3,805	3,639	657	1,867	2,842	1,988	17,826	21,318	99.97	95.32	1,638	1,891	(412)	1,221	1,071
	9 mos.	48,151	23,874	72,025	67,783	11,271	9,745	1,972	10,508	8,507	5,898	64,331	62,322	89.31	91.94	12,572	7,783	2,759	7,637	4,284
Florida East Coast	3 mos.	25,960	522	26,482	24,137	4,014	4,881	1,127	4,668	4,355	939	21,281	20,925	80.36	86.69	9,428	5,989	1,462	5,679	3,418
	9 mos.	87,164	1,483	88,647	75,014	12,738	15,669	3,386	14,836	11,954	2,820	65,540	61,044	73.93	81.37	35,293	50,922	8,764	20,950	31,970

Grand Trunk Western	3 mos.	78,376	2,667	81,043	53,635	10,580	7,803	1,641	18,826	13,041	1,599	82,500	59,358	101.79	110.67	(3,533)	(6,703)	(215)	(2,292)	(6,025)
	9 mos.	239,537	11,815	251,352	165,673	30,837	22,551	5,137	57,352	37,231	4,808	248,631	172,771	98.91	104.28	(2,777)	(10,132)	5,968	451	(7,998)
Illinois Central Gulf	3 mos.	210,542	18,840	229,382	217,140	29,704	32,445	11,743	70,511	68,075	4,752	213,541	219,504	93.09	101.08	35,882	(11,819)	9,260	29,176	(12,165)
	9 mos.	665,942	56,949	724,891	656,654	88,920	89,152	34,764	210,521	204,295	14,767	675,164	652,959	93.14	99.43	85,871	(17,349)	38,641	[illegible]	(18,382)
Kansas City Southern	3 mos.	81,181	3,564	84,745	80,469	11,920	13,471	3,743	17,010	18,636	5,260	69,368	70,017	81.85	87.01	14,059	9,045	9,422	8,077	8,507
	9 mos.	236,819	11,297	248,116	232,095	36,393	41,366	11,122	56,319	54,789	15,711	209,836	205,777	84.57	88.66	32,664	21,879	25,373	19,676	17,699
Missouri-Kansas-Texas	3 mos.	67,340	4,275	71,615	54,686	15,606	9,918	2,610	16,424	13,348	1,845	67,856	51,146	94.74	93.52	2,363	882	4,177	2,859	832
	9 mos.	201,403	11,079	212,482	168,370	40,764	27,106	7,985	51,810	40,718	4,993	199,300	154,001	93.80	91.51	7,881	7,076	14,301	7,681	7,275
Missouri Pacific	3 mos.	450,611	11,866	462,477	414,789	67,832	74,074	11,823	98,312	96,408	17,784	394,818	372,887	85.37	89.89	63,830	29,729	50,909	44,555	22,155
	9 mos	1,321,932	35,067	1,356,999	1,237,290	194,205	216,381	35,658	296,954	282,810	53,632	1,189,089	1,123,921	87.62	90.83	152,184	73,459	129,730	106,642	50,344
Norfolk & Western	3 mos.	440,341	17,906	458,247	385,307	67,971	88,893	12,023	85,803	86,005	14,280	343,685	331,774	74.99	86.10	141,427	81,882	62,838	66,157	36,335
	9 mos.	1,269,871	50,861	1,350,732	1,119,111	222,352	254,736	32,860	253,439	206,976	40,787	1,065,460	1,000,125	78.88	89.36	388,712	188,600	140,821	217,891	124,067
Pittsburgh & Lake Erie	3 mos.	12,041	832	12,873	10,095	2,444	1,328	361	2,495	4,740	359	14,147	13,757	109.89	136.27	(3,849)	(5,505)	(959)	(3,550)	(3,500)
	9 mos.	39,888	1,693	41,581	30,022	5,886	4,797	920	9,823	14,208	1,078	42,822	43,439	102.98	144.69	(9,177)	(20,549)	(919)	(8,878)	(18,544)
St. Louis Southwestern	3 mos.	105,180	1,914	107,094	96,780	14,360	15,656	4,129	28,069	24,424	6,206	101,494	91,512	94.77	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	9 mos.	326,696	4,537	331,223	271,446	41,608	38,996	12,576	83,847	67,868	17,339	299,782	261,282	90.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Seaboard System	3 mos.	660,463	14,795	675,258	609,325	89,183	107,903	16,453	169,413	155,301	15,537	587,727	577,237	87.03	94.73	82,787	20,113	62,454	54,438	19,481
	9 mos.	2,037,125	45,262	2,082,387	1,819,122	258,655	313,467	48,780	509,129	470,038	46,562	1,775,309	1,722,250	85.25	94.67	304,101	72,037	213,202	200,988	67,275
Soo Line	3 mos.	80,404	1,855	82,259	81,700	16,816	29,923	2,801	17,587	16,378	1,966	73,106	74,023	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	9 mos.	232,223	5,429	237,652	214,865	46,627	46,891	8,571	53,636	48,421	6,047	220,071	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Southern	3 mos	433,527	10,625	444,152	407,475	69,025	75,090	17,282	90,329	79,055	19,310	359,986	354,616	81.05	87.02	89,976	49,153	47,533	52,033	28,429
	9 mos.	1,319,166	30,298	1,349,464	1,199,590	191,353	195,895	51,523	271,833	241,833	57,112	1,079,961	1,025,613	80.02	85.49	273,773	160,411	159,662	158,688	98,766
Southern Pacific	3 mos.	527,247	15,445	542,692	502,666	55,711	100,535	23,094	156,817	143,629	20,828	541,840	546,176	99.75	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	9 mos.	1,601,462	49,469	1,650,931	1,462,232	172,341	289,006	65,259	479,510	411,776	63,086	1,642,464	1,506,873	99.48	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Union Pacific	3 mos.	456,321	5,785	462,106	463,261	71,502	62,814	16,611	102,730	92,532	23,307	408,373	390,297	88.37	84.24	47,127	66,383	38,267	31,604	41,215
	9 mos.	1,414,813	18,629	1,433,442	1,330,555	214,938	202,360	50,410	320,474	273,996	70,469	1,285,917	1,190,083	89.70	89.44	135,248	132,710	102,361	89,925	83,213
Western Pacific	3 mos.	36,667	937	37,594	37,443	7,791	5,407	729	7,039	10,245	1,766	41,088	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	9 mos.	113,746	2,311	116,057	115,253	20,631	18,563	2,187	24,381	30,763	5,350	123,018	132,441	106.99	114.91	(15,896)	(14,826)	1,643	(7,392)	(8,093)

Source: Interstate Commerce Commission

RAILWAY AGE

Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200 (Telex 425421 SIMB UI)

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Change of address should reach us six weeks in advance of next issue date. Send both old and new addresses with address label to Subscription Department, Railway Age, P.O. Box 530, Bristol, CT 06010 or call (203) 582-9546. Post Office will not forward copies unless you provide extra postage.
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Market Outlook

Equipment

Alaska Railroad: Ordered five GP49 locomotives from EMD for delivery by June 1.

Burlington Northern: Ordered 53 four-axle 3,600-hp GP50 diesel-electrics from Electro-Motive Division of General Motors for delivery in the second and third quarters of 1985. Estimated value of the order is $53 million. In a separate agreement with EMD, BN is accepting three new microprocessor-equipped, six-axle SD60 units for evaluation.

Maryland Department of Transportation: Ordered four AEM7 electric locomotives from the Electro-Motive Division of General Motors at a cost of approximately $13.6 million. The units, scheduled for delivery in the fourth quarter of 1986, incorporate ASEA technology; they will be placed in Baltimore-Washington commuter service.

Norfolk Southern: Will acquire 100 microprocessor-controlled diesel-electric locomotives in 1985 at a cost of about $129 million—50 SD-60 series units from the Electro-Motive Division of General Motors and 50 C39-8 series units from General Electric. Norfolk Southern anticipates fuel savings of 14% over conventional locomotives.

Facilities

BART: Awarded a $3.9-million contract to the DeLeuw-Foster-Francis consortium to manage construction of the $150-million Daly City Turnback and Storage Yard Project.

Southern Pacific: A planned $308-million 1985 capital program includes $213 million for track improvements. SP's '84 capital program was $360 million.

Union Pacific System: A 1985 capital budget of $578 million includes $525 million for roadway improvements, up $17 million over 1984 outlays. A $50-million equipment program includes 400 autorack cars, 200 covered hoppers, and 250 refrigerated trailers; a locomotive program is under review.

Revenue freight carloadings

Commodity	Dec. 8 week	Dec. 1 week	Nov. 24 week
Grain	28,861	30,235	24,724
Other farm products	4,840	5,526	4,132
Metallic ores	12,761	14,102	11,883
Coal	106,580	103,145	83,975
Crushed stone, gravel and sand	10,288	11,384	8,286
Nonmetallic minerals	10,432	13,284	7,041
Grain mill products	10,901	10,647	8,506
Food and kindred products	11,377	11,801	8,563
Primary forest products	12,599	13,874	9,226
Lumber and wood products except furniture	6,974	7,318	5,122
Pulp, paper and allied products	14,898	16,428	13,407
Chemicals and allied products	23,394	25,015	19,603
Petroleum products	4,878	5,162	3,706
Stone, clay and glass products	10,035	11,008	8,010
Coke	4,082	5,032	3,870
Metals and products	7,482	8,382	5,917
Motor vehicles and equipment	22,844	22,318	15,424
Waste and scrap materials	8,290	8,896	6,322
Forwarder and shipper assn. traffic	7,458	7,658	5,488
All other carloads	60,180	57,123	46,865
LCL traffic	173	184	135
Total Cars Loaded	**379,297**	**388,522**	**289,186**
% change from previous year	(2.9)	1.4	(0.7)

Estimated revenue ton-miles (billions)	**1984**	**1983**	**% change**
48 weeks	853.1	768.8	11.0

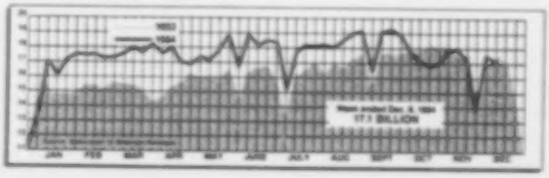
Piggyback loadings

	Dec. 1 week	Nov. 24 week	Nov. 17 week
Cars	55,143	42,935	54,967
Trailers/containers	90,931	67,517	89,656

Cumulative total, 48 weeks		**% change from 1983**
Cars	2,485,050	14.7%
Trailers/containers	4,235,777	12.4

Rail freight traffic trends

Billion ton miles (Estimated)



Freight cars

	DELIVERED			ORDERED			ON ORDER AND UNDELIVERED		
	Nov.	11 months		Nov.	11 months		Dec. 1,	Average Backlog	
	1984	1984	1983	1984	1984	1983	1984	1984	1983
Built new by carbuilders	1,225	11,600	4,825	525	14,303	5,157	4,793	6,080	3,969
Built new in RR shops	0	0	202	0	406	3	406	165	25
Built new—total	**1,225**	**11,600**	**5,027**	**525**	**14,709**	**5,160**	**5,199**	**6,245**	**3,994**
Rebuilt	0	0	100	0	0	100	0	0	0
TOTAL	**1,225**	**11,600**	**5,127**	**525**	**14,709**	**5,260**	**5,199**	**6,245**	**3,994**

Source: American Railway Car Institute

Watching Washington

Regan tax reforms would be costly for the railroads

It was difficult, in the waning days of 1984, to find a politician or an economist who had a kind word to say about Treasury Secretary Donald T. Regan's pre-Christmas proposal for sweeping tax reforms. The effects of the proposed reforms, they were saying, would be devastating for a wide spectrum of business and industry, ranging from restaurants (the business lunch would no longer be tax deductible) to the banking and insurance industries (whose reserves would be subject to higher taxes) to such capital intensive industries as the railroads (which would lose the investment tax credit and accelerated depreciation).

"For railroads, it would just simply be bad news," said Richard E. Briggs, executive vice president of the Association of American Railroads. "It would put railroads in a real tough bind."

How tough a bind was spelled out in a Goldman Sachs Research report.

Goldman Sachs pointed out that railroads actually *paid* around 3.3% in federal income taxes in 1983, although they *accrued* federal income taxes at rates generally around 35%:

"These minimal payments among railroads primarily reflect benefits from investment tax credits and from 1981 legislation that repealed for income tax purposes the retirement-replacement-betterment (RRB) method of accounting.

"For most railroads, tax accrual rates for reporting purposes would be reduced modestly if proposed tax law changes are enacted. However, this improvement would be cosmetic; the increase in actual tax payments could meaningfully reduce cash flow. Regardless of whether the tax laws are altered, railroad cash tax payments as a percent of pretax income will begin to rise gradually over the next couple of years. However, cutting back or eliminating tax credits and stretching out depreciation schedules would significantly accelerate this trend. In the 1981-1983 period, deferred federal income taxes generated an average of $150 million annually for each of the nation's five largest railroads."

Those who feel that the railroads have been getting tax breaks beyond all the boundaries of sound tax policy and fiscal common sense should read on:

"Increasing labor costs of railroads relative to truckers have eroded the competitive position of railroads. Assisted by deregulation and modernization programs, railroads have offset higher hourly earnings expense in recent years by increasing productivity. However, these modernization programs have been spurred by the tax legislation that permitted accelerated depreciation in capital expenditures and the previously frozen asset base. A reduction in these tax benefits would increase the cost of replacing labor with capital."

Goldman Sachs finds the probability that the Regan programs will be enacted to be "low." So do most other seasoned observers in Washington. Nonetheless, the Regan rumblings were enough to turn a jolly season into a jittery one.

Major Railroads' Federal Income Tax Rates for Tax and Shareholder Reporting Purposes, 1981-1983

	Current Federal Income Tax Rate			Total Accrued Federal Income Tax Rate		
Railroad	**1981**	**1982**	**1983**	**1981**	**1982**	**1983**
Burlington Northern	(0.2)%	(0.0%	2.3%	37.7%	41.6%	35.3%
CSX	2.3	3.5	(0.1)	31.7	22.7	34.5
Norfolk Southern	12.0	10.5	7.7	31.7	31.8	36.2
Santa Fe Southern Pacific	(10.9)	3.4	8.2	32.4	31.3	36.4
Union Pacific	0.9	7.4	3.3	—	—	—

Source: Congressional Joint Committee on Taxation Goldman Sachs Research

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When these wheels leave their Griffin manufacturing plant, they are round and healthy. But what will they look like after 250,000 miles?

Keeping wheels in shape

U.S. railroads spend $550 million a year on wheels. Maximizing that investment is the goal of research into testing methods, contours and other factors affecting wheel life.

By JOHN H. ARMSTRONG,
Associate Editor

"The railway car wheel probably absorbs more punishment, endures more abuse, and suffers greater injury than any item in serving the multiple purposes of the support, guidance system, torque transmitter, and brake drum for the railway vehicle. Its enemies are numerous—slipping, sliding, sanding, rail joints, snow and ice, excessive braking, and just the plain rolling under extreme loading and high speed—to name a few."

Lewis K. Sillcox's dramatization of the wheel's plight, typical of the pithy statements of this 98-year-old dean of mechanical engineers (and longtime New York Air Brake vice-chairman), remains as valid a capsulization of the situation today as when made in 1973 when he had had the advantage of only 66 years or so in the railroad business.

Acquiring and maintaining those wheels in the face of all their adversaries is expensive. Just how expensive is surprisingly difficult to determine. Even the number produced every year is a matter their manufacturers decline to announce; steel industry statistics cover only tonnage going into wheels produced by forging and rolling (51,000 tons or perhaps 120,000 wheels' worth in a very depressed 1983). Wheels replaced in railroad shops on foreign cars are well tabulated in AAR Car Repair Billing summary reports (542,000 were changed out in 1983), but wheel work on home-road cars is reported only for the roads participating in AAR's costing program. Apportioning costs between such intimately related items as wheels, axles and bearings must at best also be highly arbitrary. A slightly educated guess puts wheel costs on U.S. railroads in the $550 million a year ballpark.

Those beleaguered wheels aren't purely on the defensive, of course. Taken as a whole, the 12 million railroad wheels in the United States (97.5% of them on freight cars) have about 21,000 miles of circumference—tread and flange—with which to roll on, rub against and batter about 15 times as many miles (318,000 last year) of main-line rail. They represent 6,000,000 tons of very thoroughly unsprung weight matched against about five times as much rail. Dynamically, subtle changes in tread contour can subject vehicles to an unmerciful shaking; some lightly-loaded wheels which still look round and healthy may generate the most severe loading to which good track is subjected.

While most of those wheels are good soldiers, performing their multiple functions over lifetimes averaging 250,000 miles or so, problems (or opportunities to do better, if you prefer) are such that wheel-related research remains a major item in both FRA and AAR budgets. Problems being neither local nor technically trivial, technology has been exchanged in seven International Wheelset Congresses during the past two decades (*RA*, Nov. 30, 1981, p. 41) and an eighth is scheduled in Madrid this spring.

In taking a look at some of the directions in which improvement is being pursued, the principal ways in which wheels annoy, act up and ultimately become scrap can serve as a convenient, if perhaps undeservedly negative, framework.

• **Wearing out properly.** Ideally, all wheels should go out of service, in pairs on the same wheelset at the same time, with Code 64 or 73—"high flange" or "thin rim," respectively—in the "why made" column on the car repair billing form indicating that their treads finally wore down to the condemning limit. As Table I shows, only a tiny minority do so. Some others do almost as well—a wheel whose mate was so condemned may have a little more life left but be scrapped because its rim thickness remaining is not enough to make it worth remounting on a car headed back into interchange.

More than a third of the wheels removed are in good condition. Various matters affecting the wheelset—bearing problems, minor de-

Table I

Car repair billing trends—Wheels, 1977-83

Why Made Code		1977	1980	1983
11	Removed, Good Condition	45.6	40.2	33.8
60	Flange Thin	10.2	10.7	10.1
64	Flange High	7.9	6.0	4.4
73	Rim Thin*	3.8	1.3	0.8
75	Tread Shelled	3.8	4.0	5.7
76	Tread Built Up	5.8	5.0	3.3
78	Tread Slid Flat	3.8	4.4	3.2
85	Overheated Wheel	2.5	6.5	17.0
90/96	Mate Wheel Scrapped/ Wheel Not Reapplicable	13.3	17.2	17.5
—	Other 24 Codes, Total	3.3	4.7	4.2
		100.0	100.0	100.0

*"Bonus Metal" added to rim by some manufacturers reduces number of wheels reaching "rim thin" limit before "flange high" limit.
Source: AAR reported Car Repair Billings

railments requiring bearing inspection, axle damage—require removal but they may still go on to roll out the rest of their life span in different surroundings. A steady 3-4% are slid flat, something to blame on the brakes—or the person who misused them in one way or another. Since the normal static load on a loaded wheel stresses tread metal into the plastic range and some brake shoes and conditions may generate hot spots in the 1.600-degree Fahrenheit range, the proportion of removals for spalled or built-up tread is perhaps to be expected.

"Thin Flange" removals are a secondary target of two of today's hotter items—rail lubrication and premium trucks. Greasing the flanges, a long-time approach to increasing rail life in sharp curves, may well be in the process of demonstrating fuel savings large enough to inspire its extension to long segments of tangent and moderately-curved track (and management attention improving the reliability of its application) to the extent that the life of many wheel flanges may be enhanced willy nilly.

What about radial trucks? As noted a year ago (*RA*, December 1983, p. 48), the several hundred car-sets in service have been piling up mileage to the point where flange wear reduction can be considered demonstrated—on most, but typically not all of the population. A few wheelsets persist, for reasons still somewhat obscure, in wearing their flanges thin at a "normal" rate. As pointed out in a CN report on 240.000 miles of service with DR-1 steering trucks equipped with Class C two-wear wheels, the primary significance of a two-thirds reduction in flange wear was that much less tread metal was removed in restoring flange contour for the second wear. Overall wheel life over this highly curved line thus appears likely to reach the full two-tread-life goal—on those wheels, still likely to be in the minority, which escape removal for non-wear-related reasons. Flange wear reduction certainly correlates with the radial's other selling points—reduced railhead wear and fuel saving—but grease and alloy rail remain competitive factors in the overall economics.

- **Discoloration—$90 million worth.** About the most overt thing a wheel can do is break and forthwith cause a derailment. Wheel problems (like many other accident causes from track and equipment failures) have been on a steady downward trend in recent years. Reportable damage of $10.9 million in 1983 is still a tidy sum, worth swinging over to net income. It is overshadowed, however, by money spent in the attempt to identify and remove thermally-abused wheels before they fail.

As heavy as the static and impact loading on wheels supporting today's 100-ton cars may be, the stresses most likely to lead to wheel failure are the aftereffects of thermal abuse. Unreleased or stuck hand and air brakes, emergency stops and "drag" braking in descending long grades generate large heat inputs at individual wheel treads. To oversimplify what is actually a complex, three-dimensional matter where other locations in hub, plate or rim may also prove critical, damage can be visualized as occurring through a process such as this:

—Rim temperatures in the range of 1.000-degrees Fahrenheit expand the wheel circumference relative to the cooler plate to which it is attached, generating compressive rim stresses exceeding the yield strength of the metal, which at that temperature has been significantly reduced.

—The hot tread and flange metal is plastically compressed. When it returns to normal temperature, the rim is now in effect too short for the circumference of the plate it surrounds. The resulting tension, if not sufficient (in combination with subsequent mechanical loads) for sudden failure, will still be there to contribute to stress reversals, the growth of fatigue cracks and ultimate failure.

Actual stresses and probabilities of failure are sensitive to dozens of variables, including wheel proportions and material properties, in addition to the number, duration and severity of thermal cycles. In general, the harder the steel the more sensitive the wheel will be to thermal damage. In the wake of a pattern of failures in long-wearing U-1 high-carbon (1.0%) wheels which had been in use on a number of 70-ton cars, the AAR had reduced the maximum carbon allowable and these wheels were being phased out in the late '70s when the notoriety resulting from hazardous material accidents resulted in a crash FRA search and destroy program to get all such wheels out of the fleet.

To remove from service wheels of any type which may have been thermally abused, AAR rules have long included discoloration of certain types and degrees as cause for scrapping. After several modifications, the current 1980 FRA rule applies to any wheel exhibiting "a pattern of reddish brown or blue discoloration from heat on the front or back face of the rim extending four or more inches into the plate area with decreasing intensity...." Previous versions differed mainly in using evidence of overheating on both faces as the measure.

Discoloration admittedly is poorly correlated with the problem, since a high heat input such as 80 braking horsepower for 15 minutes will produce drastic residual stresses but little discoloration while 20 hp for an hour will discolor but not overstress. It is something that can be inspected for, however, and in the absence of any nondestructive means for measuring residual stress went into effect.

The result has been scrapping of wheels at a rate which in the most recent reporting quarter reached 180.000 per year. At $1.000 per wheelset for material and labor costs, that's $90 million.

- **Lowering those stresses.** Money down the drain at that rate with no clear proof of commensurate benefit has naturally spurred the search for better approaches to the solution. For one thing, of course, better wheels could alter the relationship between thermal inputs and wheel damage.

In progress for over 20 years—more or less coinciding with the dawn of computerized finite-element stress analysis for affordably calculating the distribution of temperatures, strains and their combinations under thermal and mechanical loads in fairly complex structure—has been a shift to lower-stress wheel designs. As exemplified by the difference between the straight-plate and curved-plate designs for a 28-inch wheel, a properly contoured wheel plate can accommodate more thermal expansion at a given stress level; typically by joining the hub at a more acute angle, the plate achieves this good thing through increased "springiness" in the radial direction. In the 28-inch wheel the difference—also helpful in the manufacturing process for these desperately-neeeded aids to piggyback and tri-level clearance problems—was crucial; the straight-plate wheel had so many plate failures that it had to be phased out of service. Griffin's "deep dish/curved plate" designs for larger wheels also date from this era.

Wheel manufacturers desiring to qualify wheel designs now must submit analyses, in accordance with AAR S-660 guidelines, using whatever finite-element program they prefer. WABL committee members considering approval also have available the independent calculations and recommendations of analysts at the AAR Chicago Technical Center. These analyses, derived on the basis of strain relationships assumed to remain within the elastic range—which they of course aren't in reality—have for some time been in the process of refinement to include the elaborations of elasto/plastic theory that should better describe what's going on; adoption of the advanced methodology will be based on verification by laboratory dynamometer tests.

In a joint FRA-AAR endeavor in progress over the last 16 months, more detailed data are being collected on all potentially thermally-related wheel failures actually causing derailment; this includes some incidents where the resulting damage does not bring them into the reportable train-accident category. Results to date provide some indication of how far improved designs have progressed toward the goal of a wheel of vastly reduced susceptibility to damage from thermal abuse:

Wheel Type	Proportion of Population	Failures	Discolored
Straight-plate (High-stress)	45%	56	20
Curved-plate (Low-stress)	55%	4	0

On this basis, the industry has petitioned the FRA (by authorizing monitored test use of new rules with the population consisting of all or most of the fleet) in effect to eliminate discoloration as a basis for the removal of low-stress wheels and for straight-plate wheels to return to the previous both-faces-discolored definition. Hearings are expected early this year.

- **The dynamometer and other artillery.** For the long haul, a multi-pronged FRA-AAR research program to define the situation to the extent that no wheel need suffer abuse beyond its capability is continuing. Some facets:

—Heat generated at the brake shoe/wheel interface and its distribution between the two is reasonably well understood, but the amount of heat removed from the wheel through its contact with the rail—calculated to be small but significant—has never been measured. The massive 450-hp dynamometer formerly at U.S. Steel's Monroeville, Pa., laboratory is now in service at the AAR Tech Center; its first test series is measuring this heat flow by pressing a nine-foot wheel (with tread contour simulating 136-pound RE rail) against the

The dynamic eighth of the car

Wheels account for about one eighth of the light weight of a freight car or about 5% of the gross weight of a freight train with an average proportion of loads and empties; those making precise calculations of train acceleration and braking must add a similar percentage to the linear kinetic energy of the train at any speed to account for the *rotational* K.E. of the wheels.

Watching over wheel matters on all cars in interchange service is the Wheels, Axles, Bearings, Lubrication ("Wobble") Committee of the Mechanical Division of the AAR, to whose specifications wheels and wheelsets in service throughout North America are built, inspected and maintained. Membership represents 15 railroads and Trailer Train (voting) plus Amtrak (non-voting).

Since 1970, wheels on U.S. railroads must meet FRA Freight Car Safety Standards (Part 215 of the Rail Safety Act) which make mandatory those design, condition, inspection and maintenance aspects considered critical to safety. With suitable adjustments (AAR wheel-flat limit is two inches, for example, to catch cars before they run afoul of the 2½-inch FRA limit with its accompanying civil dollar penalty), these match corresponding AAR Standards.

Except on a few properties (notably the Bay Area Rapid Transit) where minimizing weight by using aluminum-alloy wheel centers with separate steel tires is considered worthwhile, wheels are now steel. The long-wearing chilled car wheel, dominant in freight service for over a century, was created by casting iron in a sand mold surrounded with a metal "chill ring" which contoured tread and flange. The resulting fast but localized cooling rate created an unmachinably-hard white-iron rim grading into a soft, grey-iron center which could be bored concentric with the circumference. After a long period of evolutionary design the resulting single-plate, 850-pound wheel with spiral flange-support bracketry was at least marginally equal to structural and thermal demands in 70-ton capacity cars traveling at moderate speeds. The last cast iron wheels were phased out of U.S. interchange service by 1968, replaced by the tougher, if generally softer, steel wheels which became mandatory for all new freight cars in 1957.

Today's wheels are either wrought, using roll-forging processes developed over the many decades during which steel wheels were found primarily in passenger and locomotive service, or cast, by advanced foundry techniques developed as the iron wheels were being eliminated. On the basis of expected service, selection is made from five principal combinations of composition and hardness. (See table below.)

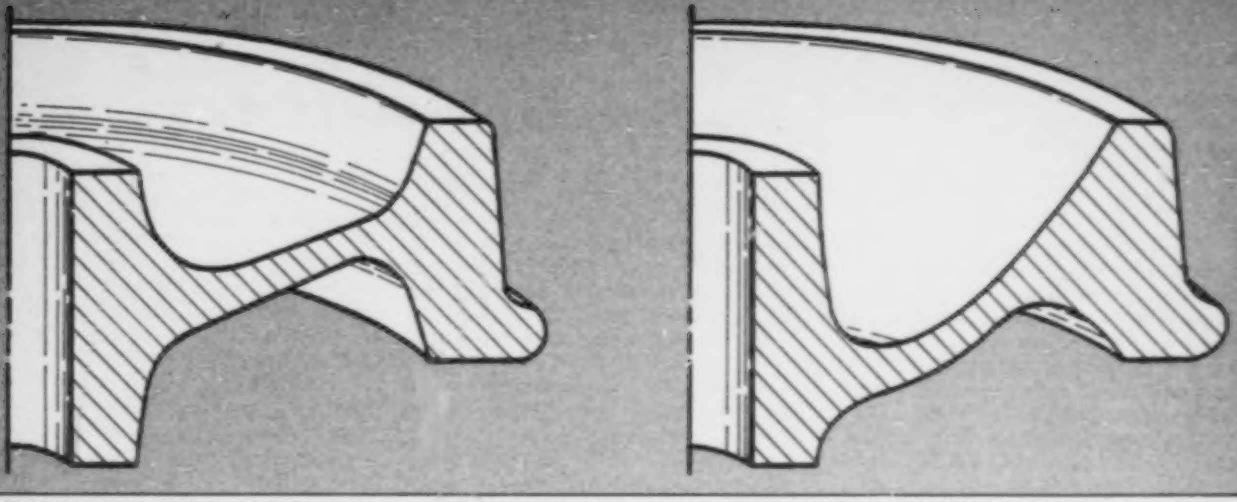
For freight service, rim thickness is classified as 1-W (one-wear), 2-W (two-wear) or M-W (multi-wear), allowing for no, one or two re-contourings for periods of extended service before tread wear ultimately leads to scrapping—if nothing else has caused the wheel to be removed from service. Lower cost per mile of service is balanced against extra initial weight (88 pounds for the 2-W, 175 pounds for the relatively rarely-specified M-W wheel).

In the interest of somewhat reduced contact stresses between rail and wheel, the long-standard 33-inch nominal diameter for all car capacities up to 70 tons (55,000-pound axle load) was increased to 36 inches for 100-ton (62,720 pounds) and 38 inches for 125-ton (78,750-pound maximum, authorized only on specific routes) nominal car capacities. Larger wheel diameters, though desirable from a track standpoint, would cause coupler-height/underframe design problems in car design as well as increasing the wheel's already considerable contribution to tare weight.

For piggyback and tri-level autorack service where car height is critical there are 28-inch wheels (70-ton nominal capacity). Diesel locomotive wheel diameter is standardized at 40 inches and passenger car at 36 inches, but transit (heavy-rail) diameters are more individualistic—mostly within the 27- to 33-inch range.

Since even these choices can result in an awkwardly large inventory of possible combinations, the AAR Committees concerned have been diligently eliminating variations wherever possible. All wheels are now manufactured to the "AAR wide" (1¾ inch) flange configuration providing for increased wear before condemnation; 2-W or M-W wheels can then be recontoured to the "AAR narrow" (1 5/32 inch) standard for further service, minimizing the amount of tread metal that must be removed to bring the flange back into serviceable configuration.

Class	Heat Treatment	Carbon Content (Per Cent)	Rim Harndess (BHN)	Recommended Service Conditions		
				Wheel Load	Speed	Braking
U	Normalized	0.65 - 0.77	—	General Service		
L	Rim Quench & Draw	0.47 max.	197-277	Light (Passenger)	High	Extreme
A	"	0.47 - 0.57	255-321	Moderate	High	Severe
B	"	0.57 - 0.67	277-341	Heavy	High	Moderate
C	"	0.67 - 0.77	321-363	Heavy	High	Light



The straight-plate 28-inch wheel (left) had so many plate failures it had to be phased out of service. The curved-plate wheel (right) is proving that a contoured wheel plate can accommodate more thermal expansion.

wheel as various braking loads are applied at speed. In its new location the dynamometer can safely test wheels to failure as appropriate to later phases of the overall research program.

—Typically, it's not the average braking load, in repeated, emergency or drag braking, that leads to broken wheels—it is more likely to be that individual overloaded brake shoe. With the Rail Dynamics Lab's "roller rig" at Pueblo it is possible to determine the distribution of this population by actuating the braking system of a complete car-end at many speeds and feeds, and such runs are scheduled.

—Residual stress being the culprit, anyone with an idea for nondestructive means of measuring it is welcome to try—in fact, some instrumented wheels inadvertently so severely overheated that they are known to be full of stresses exist at Pueblo. However, results of past demonstrations in field or laboratory have been so dismal that this is not a primary approach. Correlations between known thermal inputs and resulting residual stress conditions by such brutal methods as measuring the results of sawing through the rim have proven most useful in the past; in combination with refined analyses and dynamometer testing to destruction, such testing will continue.

• **Crucial contours.** A new flange is one inch high—and, iron or steel, cast or wrought, English or metric equivalent, so it has been for 150 years with no argument. It stands taller as the tread wears down, remaining acceptable in this respect until it is 50% higher.

Settling upon and maintaining the dimensions and contour for the rest of the wheel face is something else. Tread taper and tread-flange fillet contours on the wheelset generate the conicity that keeps flange faces away from the rail heads on tangent track and at least helps the assembly move easily around curves. These contours determine the stability of the whole vehicle but they do so only as they relate to the railheads—which, like the wheel surfaces, change shape at least a little with every train-mile.

Some aspects of this matter are fairly well settled. Wheels turned to the AAR 1:20 contour running on new RE rail represent a generally stable combination, with hunting in cars equipped with standard three-piece freight trucks in most classes of service to be expected only at speeds above the economical operating range. With wear, the effective conicity of the wheel at the fillet increases and the stability of the system on tangent track decreases—to an extent that may drop the severe hunting threshold down into the operating range, as has been rather thoroughly re-examined over the last decade in connection with the Truck Design Optimization (TDOP) and Track-Train Dynamics (TTD) programs. Over most of its life in most classes of service the AAR 1:20 remains the choice, but there are problems which keep other contours popping up:

—A characteristic of the AAR 1:20 contour on new rail is two-point contact between wheel and railhead, with a band in the fillet between tread and flange not actually in contact. The resulting relatively high relative creep velocities rather quickly wear enough metal from wheel and railhead gauge corner to achieve a single-point configuration. Why not save this metal by starting out with such a "worn wheel" profile?

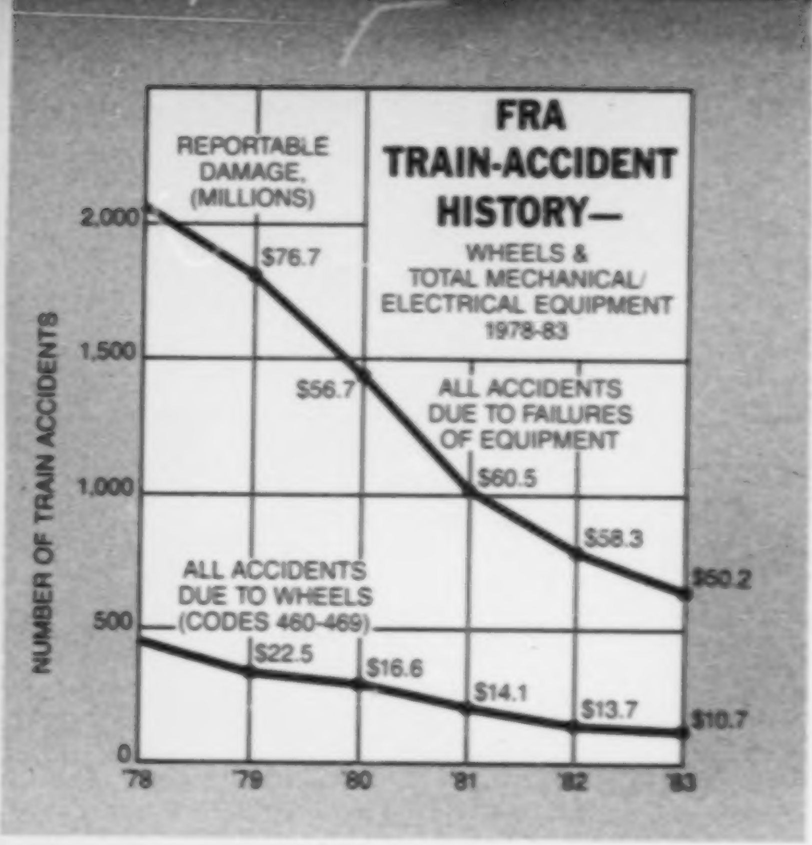
Widely used on diesel locomotive wheels is a "unipoint" modification to the AAR 1:20 intended to do just that. Another example with considerable acceptance in North American freight service is the "modified Heumann" contour developed by the Canadian National and in use on those non-radial-truck gondolas in Alberta-Pacific Coast unit-train coal hauling service which serve as the controls against which wheel wear of the DR-1 radials (above) is being compared. In general service where empty cars may travel at high speed with wheels approaching the condemning limits of tread wear, control of hunting by some combination of truck, side bearing, center plate and carbody hardware must be part of the picture and the "worn wheel" contour may not be acceptably stable.

—For situations where the utmost in resistance to hunting on the part of the wheel contour itself is considered essential, there is an alternate AAR standard cylindrical configuration in which the first two inches of tread beyond the root of a standard flange have no taper at all. Used on BART's 75-mph trains and some other transit and railroad properties, this contour of course sacrifices some of the assistance which tread taper provides toward low-friction/low-wear performance on curved track.

Significant as they may be to performance, these tread contours are so similar that it takes a sharp and practiced eye to see any difference at all, although such modern, highly automated wheelshop equipment as that manufactured by Farrel, Stanray or Hegenscheidt can rapidly restore wheels to the specified shape with a calculated minimum of metal removal.

In consideration of the impressive sums involved in wheel procurement and maintenance decisions on wheel shapes (and the somewhat related matter of tie-plate cant as it affects the mating angle of the rail surfaces), an AAR program to provide railroads and car owners with a better handle on the whole matter is under way. As discussed in a recent TTD Newsletter (*RA*, September 1984, p. 95), one possible result of the program might be a new ideal freight-car wheel contour. If (as seems more likely) no single optimum emerges, service conditions favoring one or another contour should at least become better defined. Included are tests under closely controlled conditions at Pueblo, collection of extensive data on actual rail configurations in the field and statistical analyses of the overall economics of the situation.

• **The importance of being round.** As the principal element of unsprung weight in the vehicle system, wheels at 900 pounds or so pose a major threat to track components—especially those in good track with its high stiffness. Just how rough wheels can be has been qualified on the Northeast Corridor with the installation of the first full-time wheel-



impact detector (*RA*, July 1984, p. 83) at Edgewood, Md. As reported at last month's ASME meetings in New Orleans, FRA/Amtrak/Battelle investigations leading up to the "Kips Machine" found some car wheels of unexpectedly out-of-round character, mostly among the "Heritage Fleet" of rebuilt passenger cars, which generated impacts of as much as 90 kips (90,000 pounds, an amplification of 5.3 times the static wheel load) at 100 mph.

Not long after the detector started identifying the individual impact load of passing axles, Amtrak's new Stanray wheel-truing equipment at its Corridor maintenance shops went into service, and axles producing impacts exceeding a 60,000-pound threshold could be given end-of-trip attention. The improvement was dramatic. The threshold has subsequently been lowered to 55,000 pounds as wheel quality in the entire passenger car fleet has continued to improve. Freshly-turned Heritage Fleet wheels, incidentally, register loads at 100 mph typically deviating only 5% from the static value.

Does this program, occasioned by the generation of hairline cracks in concrete ties by impact loads exceeding 75,000 pounds, have relevance to the freight railroad operating at more modest speeds over less high-strung track? Quite possibly so—a few freight impacts each week exceed the 102,000-pound upper limit of the detector, and a few of the most damaging wheel contours found were of a nature not condemnable by AAR out-of-round ("in excess of 1/32 inch within an arc of 12 inches or less with use of gauge") standards.

Without going into the identification of individual axles in freight traffic which ring up excessive impacts on the detector, Corridor engineers have been looking at impact-load data by class of train. From a preliminary survey of impact severity in 10-kip increments accumulated over 35,000 passing axles, there are indications that some consists in captive or unit-train service—where routine maintenance to higher standards might well be feasible—may currently be generating a disproportionate number of impacts at the higher levels.

• **Off the track.** A major endeavor of the FRA is the ongoing program aimed at track and equipment safety standards more closely tied to the factors that actually determine whether or not the wheel leaves the rail. Tests to verify analyses and determine the actual performance limits of both track and rolling stock components naturally require approaching but not passing derailment limits—except, perhaps, on the final test of a series.

In 1896, long before the Track Train Dynamics program brought "L/V force ratios" into the language of operating railroaders, French researcher M.J. Nadal promulgated a number (based mostly on wheel/rail geometry and a coefficient of friction) in the vicinity of 0.8 as the ratio of the lateral force to the vertical force on the outer leading wheel of a truck at which the flange was likely to climb the rail. As one of the ways—along with rail overturn, gauge widening and overturning—in which derailment could occur, this "Nadal limit" has been of more than casual interest to those pushing the limits of rail technology or testing.

More recently, with the aid of far more instrumentation, instances have been found in which brief L/V's as high as 2.0 didn't result in derailment. Expressions combining L/V ratios with corresponding minimum time durations which seemed to match some test results were developed on the Japanese National Railways and adapted by Electro-Motive to North American dimensions. Although dynamic analyses and scale model tests at Princeton conducted for the FRA have been unable to verify any such connection between duration and derailment, these JNR expressions have been used as test-safety guides in the absence of anything better.

Also presented at the recent ASME conference were results of a Transportation Systems Center re-examination of the matter by Herbert Weinstock. By taking into account rail forces on the non-flanging (inner) wheel as well, rail-climb expressions not involving duration of the L/V force have been derived which have checked out well with available test results. Less over-conservative than Nadal, these are expected to lead to testing with greater confidence—at the Test Center and in the field, on good, bad and indifferent track—over the broader range of conditions.

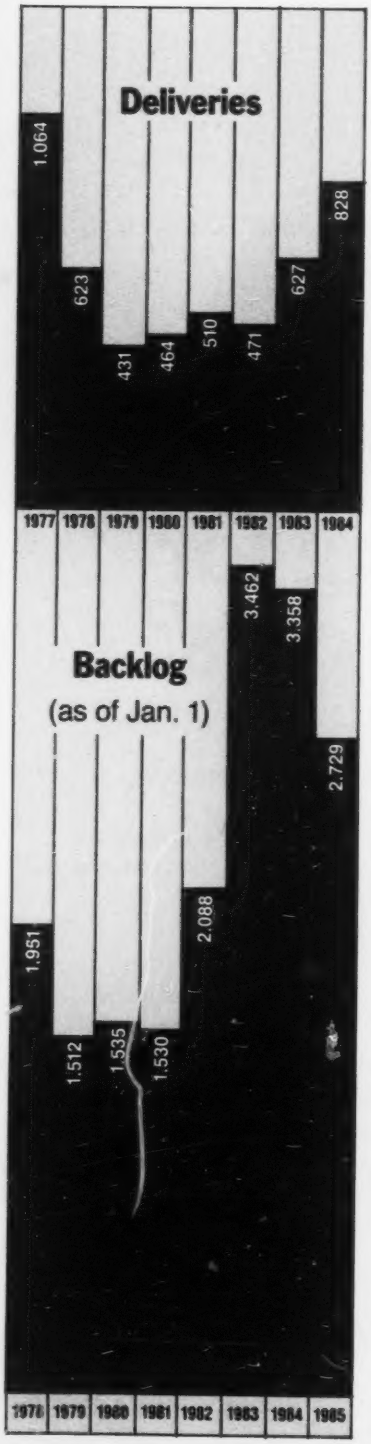
• **Managing the wheel "fleet."** As long as there are wheels, there will be manufacturers to turn them out. With wheels expiring more or less on a mileage/tonnage basis it would appear that fluctuations in railroad and car-owner purchases should be far less violent than in new-car orders, and until the last few years this has been somewhat true.

However, the new-car binge of 1978-79, which strained North American wheel manufacturing capacity to the limit and resulted in the import of more than 200,000 wheels in the peak year, has left a legacy of wheelsets still to be worked off before the current upturn of traffic shows up at the wheel manufacturer's plants. Both of the cast wheel suppliers—Abex and Griffin—have newly-equipped plants which have not been put into production; wrought wheel manufacturers in the U.S. and Canada number only three—Canadian Steel Wheel, Edgewater, Standard Steel—and all are working far, far below capacity.

Data keeping on the comparative performance of wheels in service has been spotty—until fairly recently, individual identifications were marked on the rim where they were easy prey to retarder shoes. Now they're on the hub or cast into the plate. Some private car owners and railroads have long since demonstrated that much closer tabs can be kept on wheels, and with profit.

By and large, shopwork maintaining those 12 million highly identical round objects in the U.S. railroad fleet has become highly centralized, mechanized, automated, efficient; as research results firm up and as mergers increasingly make "their" wheels "our" wheels, perhaps such choices as those between heat-treated and non-heat-treated wheels (for which no price differential is allowed on repair) will be made increasingly on performance bases. ■

Passenger-car market at a glance



These cars were delivered in 1984:

Purchaser	No. of cars	Type	Builder
Atlanta (MARTA)	12	Rapid transit	Hitachi
Baltimore (MdMTA)	24	Rapid transit	Budd
Buffalo (NFTA)	24	Light rail	Tokyu Car
Calgary	36	Light rail	Siemens-Duewag
Chicago (CTA)	108	Rapid transit	Budd
Cleveland (GCRTA)	22	Rapid transit	Tokyu Car
Miami (MDTA)	50	Rapid transit	Budd
	6	People movers	Westinghouse Electric/ Kawasaki
New York (LIRR/Metro-North)*	128	Commuter	Budd
New York (NYCTA)	205	Rapid transit	Kawasaki
	10	Rapid transit	Bombardier
Portland (Tri-Met)	5	Light rail	Bombardier
San Francisco (Muni)	30	Light rail	Boeing-Vertol
Toronto (TTC)	22	Rapid transit	Can Car (UTDC)
Vancouver (BC Transit)	6	ICTS	UTDC
VIA Rail Canada	50	Intercity	Bombardier
Washington (WMATA)	90	Rapid transit	Breda
Total	828		

*First 142 cars of this combined Metro-North/LIRR order will go to Metro-North, the remaining 174 to LIRR.

Work goes forward on this undelivered backlog:

Purchaser	No. of cars	Type	Builder
Amtrak	3	Intercity	Budd
Atlanta (MARTA)	68	Rapid transit	Hitachi
Boston (MBTA)	50	Light rail	Kinki-Sharyo
	54	Rapid transit	Can Car (UTDC)
Baltimore (MdMTA)	28	Rapid transit	Budd
Buffalo (NFTA)	1	Light rail	Tokyu Car
Caltrans	63	Commuter	Sumitomo/Nippon-Sharyo
Calgary	2	Light rail	Siemens-Duewag
Cleveland (GCRTA)	38	Rapid transit	Tokyu Car
Chicago (CTA)	270	Rapid transit	Budd
Detroit (SEMTA)	12	DPM	UTDC
Maryland DOT	11	Commuter	Sumitomo/Nippon-Sharyo
Miami (MDTA)	66	Rapid transit	Budd
	6	People movers	Westinghouse Electric/ Kawasaki
New York (LIRR/Metro-North)	188	Commuter	Budd
	39	Commuter	Bombardier
New York (NYCTA)	95	Rapid transit	Kawasaki
	815	Rapid transit	Bombardier
	225	Rapid transit	Westinghouse/Amrail
Pittsburgh (PAT)	55	Light rail	Siemens-Duewag
PATH (PA of NY/NJ)	95	Rapid transit	Nissho Iwai/Kawasaki
Portland (Tri-Met)	21	Light rail	Bombardier
Sacramento	26	Light rail	Siemens-Allis
San Diego (MTDB)	6	Light rail	Siemens-Duewag
San Francisco (BART)	150	Rapid transit	Soferval
Santa Clara (SCCTA)	50	Light rail	Metro Canada
Toronto (TTC)	126	Rapid transit	Can Car (UTDC)
	6	Rapid transit	UTDC
	52	Light rail	Can Car (UTDC)
Vancouver (BC Transit)	108	ICTS	UTDC
Total	2,729		

Orders likely to develop in 1985:

Purchaser	No. of cars	Type
Atlanta (MARTA)	20	Rapid transit
Boston (MBTA)	85	Commuter
Los Angeles (SCRTD)	30	Rapid transit
New York (Metro-North)	54-75	Commuter
Philadelphia (SEPTA)	50-70	Commuter
San Diego (MTDB)	10	Light rail
Toronto (TTC)	11	Light rail
Toronto (Go Transit)	40	ALRT
VIA Rail Canada	0-30	Intercity
Total	300-371	

The five year (1986-1990) outlook:

Purchaser	No. of cars	Type
Amtrak**	60-140	Intercity
Atlanta	0-30	Rapid transit
Boston (MBTA)	1-60	Commuter
	0-50	Light rail
Calgary	0-8	Light rail
Caltrans	10	Commuter
Chicago (CTA)	100-400	Rapid transit
Dallas (DART)	523	Light rail
Detroit (SEMTA)	0-57	Light rail
	0-20	Commuter
Los Angeles (LACTC)	44-60	Light rail
Los Angeles (SCRTD)	100	Rapid transit
New York (NYCTA)	600	Rapid transit
New York (LIRR/Metro-North)	0-146	Commuter
Philadelphia (SEPTA)	20-30	Light rail
Portland (Tri-Met)	0-25	Light rail
San Diego (MTDB)	0-10	Light rail
Vancouver (BC Transit)	20-40	ICTS
VIA Rail Canada	100-150	Intercity
Washington (WMATA)	100-300	Rapid transit
Total	1,878-2,759	

**1983 projection

c8400-1

High-speed studies pick up momentum

February 1985

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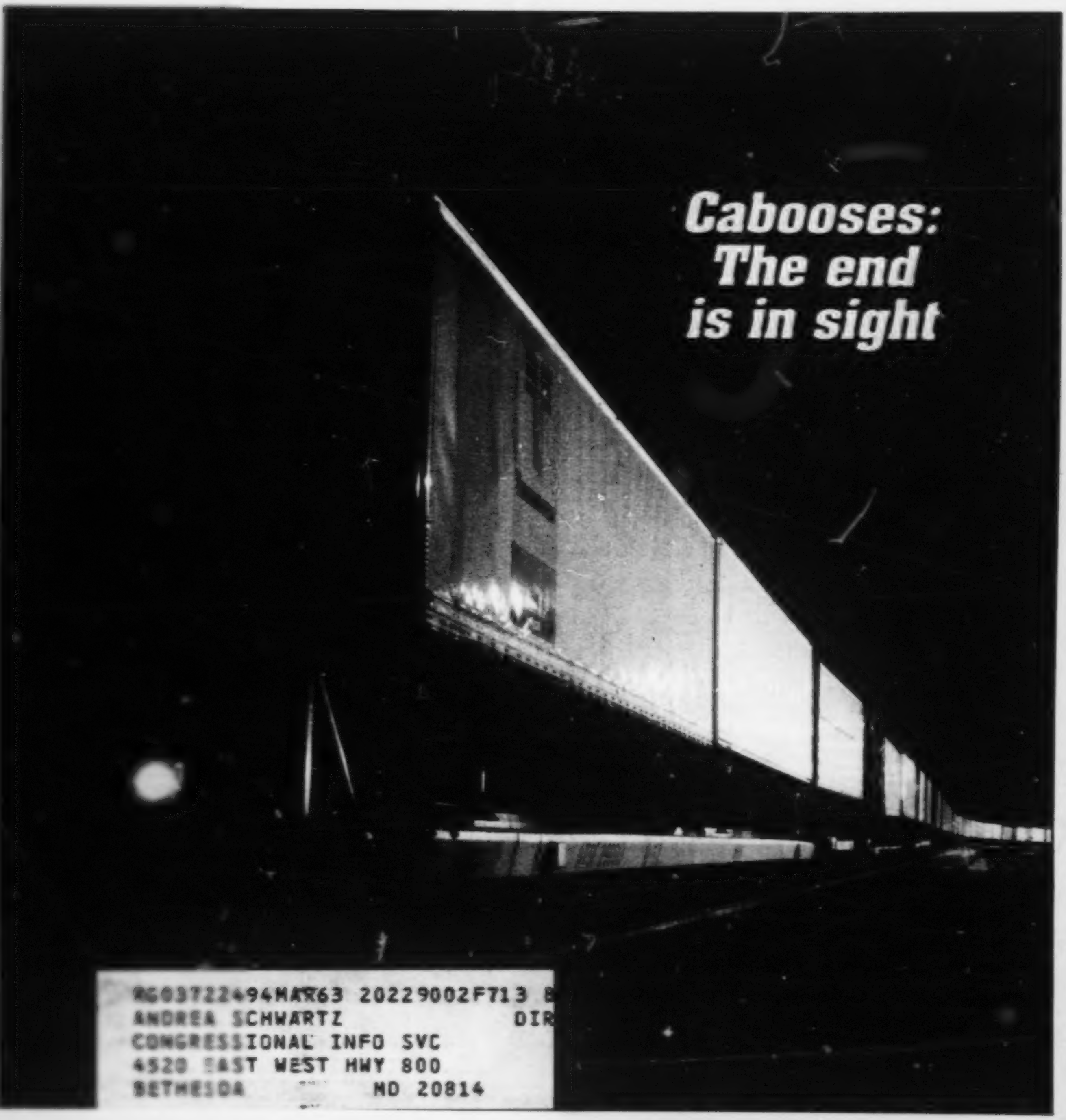

Cabooses: The end is in sight

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RAILWAY AGE

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27 Cabooses: The end is in sight

Cabooseless operations are safer as well as cheaper. That's the finding of railroads that are now running 1,000 cabooseless trains.

35 PLC looks to diversified role

Pullman Leasing, with a fleet of more than 24,000 cars, is no longer tied to the equipment of a single builder as it seeks to broaden its base.

36 Light weight, heavy return

Detroit Edison's experience with aluminum/steel cars has proved so rewarding that the utility is buying three new trainsets from Ortner.

40 Laser beams bright in CN's future

Reliability and truck-competitive rates helped put CN's Montreal-Toronto trains in the win column. Now, Laser service is ready for expansion.

44 High-speed rail: Down to serious business

The map of proposed high-speed passenger corridors is getting less cluttered, but planners who are still on the job seem to mean business.

53 Amtrak: Miracle at Beech Grove

Brought back from the brink of obsolescence, the shop is efficiently handling Amtrak's work and assembling subway cars under contract.

63 Winning the war on weeds

Most vegetation control is now in the hands of contract killers, who are bringing an impressive arsenal of weapons to bear on the problem.

RAILWAY AGE
Cabooses
The end
is in sight

Cover: Santa Fe's Los Angeles-Chicago intermodal train is running cabooseless. The railroad has opted for the Glenayre end-of-train monitoring system. *Page 27.*

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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014 USPS 449-130, Vol. 186, No. 2

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years; all other countries $35 one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies $3 plus postage and handling, except special issues.

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Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT. 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

Market Outlook

Equipment

CN Rail: Ordered 260 48-foot piggyback trailers from Le Groupe Canam-Manac Inc. of St-Georges-de-Beauce, Que., at a cost of nearly $5.5 million (Canadian). Capacity of each new trailer will be 3,478 cubic feet, 11% more than a 45-foot trailer.

New York City Transit Authority: Awarded a $50-million contract to Morrison-Knudsen to rebuild 236 subway cars. The work will be performed at M-K's Hornell, N.Y., facility.

W.H. Miner Division: Miner AggreGate outlets have been selected for 140 new ballast cars that Norfolk Southern will acquire this year (*RA*, December 1984, p. 12). Miner AggreGates were also selected by Burlington Northern for 300 of 400 ballast cars that are being retrofitted at the St. Cloud shop.

Facilities

BC Transit: Awarded a $3.3-million (Canadian) contract to Autelca AG of Switzerland for 100 BE-128 automatic ticket vending machines.

CN Rail: Awarded a $160,000 (Canadian) contract to Enterprise Electrique Roger Tremblay Ltee. for installation of a computerized energy management system in its Pointe St. Charles car shop at Montreal. A first for CN Rail shops, the new system will use microprocessor-based technology to control light, heat, air, steam and electricity.

Norfolk Southern: Will invest $496 million in roadway and other fixed plant improvements in 1985; $90 million is for projects carried over from 1984, and $406 million is for new projects (a 21.5% increase over 1984). Track work, budgeted at $276.9 million, calls for surfacing 5,000 miles, inserting 2.5 million crossties, and installing 875 miles of new and relay welded rail. A new intermodal yard will be built at Charlotte, N.C., and an existing intermodal yard at Chesapeake, Va., will be expanded. The budget also calls for additional ctc, track additions for the new General Motors assembly plant near Ft. Wayne, Ind., and dredging at the Norfolk, Va., coal piers.

Revenue freight carloadings

Commodity	Jan. 5 week	Dec. 29 week	Dec. 22 week	Dec. 15 week
Grain	17,989	16,971	28,104	27,741
Other farm products	3,436	3,266	4,150	4,677
Metallic ores	8,130	8,037	11,200	11,005
Coal	77,057	65,957	112,000	113,439
Crushed stone, gravel and sand	6,805	5,830	9,111	10,527
Nonmetallic minerals	9,175	8,580	10,346	10,150
Grain mill products	8,220	7,421	10,539	10,533
Food and kindred products	7,807	7,107	10,241	11,025
Primary forest products	8,421	6,773	12,387	14,089
Lumber and wood products except furniture	4,030	4,216	7,300	8,000
Pulp, paper and allied products	12,451	8,236	15,042	14,851
Chemicals and allied products	16,622	16,960	25,210	23,673
Petroleum products	3,500	3,380	5,002	4,957
Stone, clay and glass products	7,288	6,727	9,210	9,700
Coke	4,073	3,536	4,510	4,579
Metals and products	6,150	4,980	7,446	7,533
Motor vehicles and equipment	16,544	7,676	19,578	23,702
Waste and scrap materials	5,174	4,450	7,082	8,000
Forwarder and shipper assn. traffic	4,148	4,460	6,757	7,400
All other carloads	28,315	25,390	60,500	60,910
LCL traffic	137	91	173	181
Total Cars Loaded	257,299	220,649	376,306	387,382
% change from previous year	(13.4)	(6.9)	17.7	(0.5)

Estimated revenue ton-miles (billions)	1985	1984	% change
1 week	12.1	14.1	(14.1)

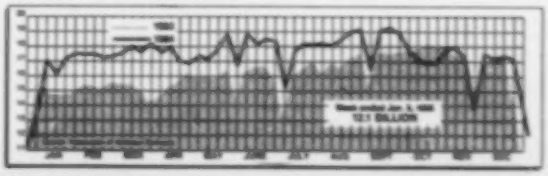
Piggyback loadings

	Dec. 29 week	Dec. 22 week	Dec. 15 week	Dec. 8 week
Cars	35,449	56,286	57,441	56,446
Trailers/containers	57,506	90,538	93,576	91,895

Cumulative total, 52 weeks		% change from 1983
Cars	2,880,650	14.6%
Trailers/containers	4,569,094	11.7

Rail freight traffic trends

Billion ton miles (Estimated)



Freight cars

	DELIVERED			ORDERED			ON ORDER AND UNDELIVERED		
	Dec.	12 months		Dec.	12 months		Jan. 1,	Average Backlog	
	1984	1984	1983	1984	1984	1983	1985	1984	1983
Built new by carbuilders	796	12,386	5,570	751	15,054	5,982	4,748	6,388	3,880
Built new in RR shops	0	0	202	0	406	2	406	185	23
Built new—total	796	12,386	5,772	751	15,460	5,984	5,154	6,184	3,903
Rebuilt	0	0	100	0	0	100	0	0	23
TOTAL	796	12,386	5,872	751	15,460	6,084	5,154	6,184	3,926
Locomotives (new and rebuilt)	100	500	318	N/A	N/A	N/A	108	107	116

Source: Transportation Div., AAR and American Railway Car Institute

C8400-1

March 1985

Amtrak gets ready to phase in CETC

...for the new age of railways

High tech on the right-of-way

Southern's crewless tamper

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RAILWAY AGE

...for the new age of railways

March 1985

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31 High-tech maintenance

Traditionally conservative engineering departments have been slow to enter the computer age, but the net result of their efforts is a high-tech roadway.

37 Trains give NASA a boost

Railroads in general—and the 42-mile Kennedy Space Center Railroad in particular—are helping NASA keep costs down as it puts space vehicles up.

42 Trailers/containers: Sizing up the fleet

Suppliers are moving quickly to respond to changing demands. The trend is toward longer trailers, short double-bottom units, and stacked containers.

45 A Railroader's Guide to Washington

The updated *Railway Age*/Unit Rail Anchor listing covers the 99th Congress as well as other key contacts in the nation's capital.

68 Amtrak's CETC: A long, hard road

Software was the toughest problem confronted by designers of the integrated control system, which is now ready for phase-in at Philadelphia.

75 Track-Train Dynamics Newsletter

Eight companies have submitted initial concept proposals for the High Productivity Integral Train Project; two are in the component-testing stage.

Cover: Southern's automated tamper was photographed by *Railway Age* Photo Editor Roy H. Blanchard.

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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014

USPS 449-130, Vol. 186, No. 3

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years; all other countries $35 one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies $3 plus postage and handling, except special issues. Copyrighted © 1985.

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Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT. 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

Market Outlook

Equipment

BC Rail: Ordered five SD40-2 locomotives from the Diesel Division of General Motors of Canada Limited, not from the Electro-Motive Division of General Motors as earlier reported (*RA*, December 1984, p. 12).

CN Rail: Major items in a $594-million (Canadian) 1985 capital budget include $118 million for new and rebuilt locomotives, $55 million for new and converted freight cars, $36 million for intermodal equipment and facilities, $75 million for rail, $52 million for 1.8 million wood and 200,000 concrete ties, and $23 million for two million cubic meters of ballast. Of the total capital budget, $244 million is allocated for western expansion and upgrading, bringing to more than $1 billion the railroad's investment in the west since 1980.

- Contracts were announced in February for 205 new freight cars costing $34 million. National Steel Car will supply 52 low-deck, articulated, five-platform intermodal cars at a cost of just over $17 million, and Hawker Siddeley will supply 153 fully-enclosed bi-level cars at a cost of almost $17 million.
- CN Rail will rebuild 43 locomotives at its Pointe St. Charles shops this year at a cost of approximately $32 million.

Chessie System: Will acquire 662 new multi-level rack cars to handle anticipated automotive business expansion.

Facilities

Bay Area Rapid Transit: Broke ground Feb. 11 for the long-planned $150-million Daly City Turnback Project, part of a five-year, $500-million effort designed to expand BART's peak-hour capacity by 85%.

Chessie System: Included in a $173-million 1985 track program will be installation of 500 miles of cwr, insertion of 2 million crossties, and 5,000 miles of surfacing.

Seaboard System: Plans to install 623 miles of cwr, insert 1.9 million crossties, and surface 7,400 miles as part of this year's $203-million track program.

Revenue freight carloadings

Commodity	Feb. 9 week	Feb. 2 week	Jan. 26 week	Jan. 19 week
Grain	23,562	25,722	24,113	26,970
Other farm products	3,296	3,765	4,275	5,087
Metallic ores	13,629	12,791	10,267	9,456
Coal	100,710	100,064	85,100	103,737
Crushed stone, gravel and sand	7,720	7,878	7,161	8,705
Nonmetallic minerals	10,224	10,417	8,999	9,103
Grain mill products	10,977	11,113	10,422	10,847
Food and kindred products	11,075	11,145	10,744	10,895
Primary forest products	11,139	12,042	11,120	13,105
Lumber and wood products except furniture	6,372	7,258	6,903	6,853
Pulp, paper and allied products	14,375	14,893	13,759	14,688
Chemicals and allied products	24,300	24,865	24,038	24,900
Petroleum products	4,625	4,702	4,596	4,811
Stone, clay and glass products	8,091	8,769	8,377	9,278
Coke	4,812	5,137	3,862	5,048
Metals and products	8,242	8,802	7,145	7,722
Motor vehicles and equipment	22,057	22,113	20,648	22,736
Waste and scrap materials	8,198	8,451	7,372	8,899
Forwarder and shipper assn. traffic	7,069	7,242	6,335	6,399
All other carloads	55,857	56,519	52,417	54,987
LCL traffic	156	255	166	132
Total Cars Loaded	**356,486**	**363,943**	**327,819**	**364,358**
% change from previous year	(9.8)	(8.4)	(15.2)	(0.8)

Estimated revenue ton-miles (billions)	**1985**	**1984**	**% change**
6 weeks	94.9	102.7	(7.6)

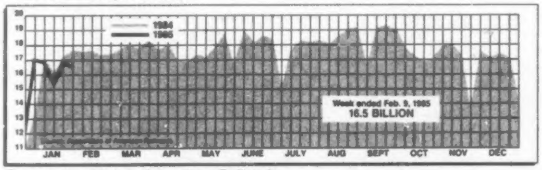
Piggyback loadings

	Jan. 26 week	Jan. 19 week	Jan. 12 week	Jan. 5 week
Cars	50,048	51,119	49,842	33,791
Trailers/containers	80,439	81,277	78,944	54,623

Cumulative total, 4 weeks		**% change from 1984**
Cars	184,800	1.3%
Trailers/containers	298,763	(7.1)

Rail freight traffic trends

Billion ton miles (Estimated)



Source: Association of American Railroads

Freight cars

	DELIVERED		ORDERED		ON ORDER AND UNDELIVERED	Average Backlog	
	Jan.		Jan.				
	1985	1984	1985	1984	Feb. 1, 1985	Jan. 1, 1985	Feb. 1, 1984
Built new by carbuilders	887	415	403	2,736	4,064	4,548*	5,650
Built new in RR shops	336	0	0	0	70	406	0
Built new—total	**1,223**	**415**	**403**	**2,736**	**4,134**	**4,954**	**5,650**
Rebuilt	0	0	0	0	0	0	0
TOTAL	**1,223**	**415**	**403**	**2,736**	**4,134**	**4,954**	**5,650**
Locomotives (new and rebuilt)	23	15	N/A	N/A	253	108	85

Source: Transportation Div., AAR and American Railway Car Institute

*Revised figure.

c8400-1

The economics of double-stack trains

April 1985

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GOODBYE TO ALL THIS?

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AMTRAK UNDER SIEGE

RAILWAY AGE

April 1985

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Features

37 Amtrak under siege

The Reagan Administration's arguments for zero-budgeting Amtrak make neither economic nor social sense. They also reflect an astonishing about-face at the DOT.

45 The great yard swap

When a Duluth rail yard got in the way of an Interstate highway, MnDOT embarked on the largest track relocation project on record, including building a whole new yard.

55 Montana rail finds new life in Texas

With the help of L.B. Foster, a Texas utility made significant savings by using relay cwr for a new 35-mph lignite coal line.

57 Galesburg gears for growth

An increasingly busy traffic hub for BN, the Galesburg yard is getting $73 million worth of modernization, including a new locomotive shop.

62 APL Linertrains stack up profits

Having made "a real breakthrough with merchandise business in the rail industry," APL is buying three additional trainsets.

70 New power control for Metro-North

A computerized supervisory control system operates both traction and signal power from headquarters in New York.

77 Trolleys try for New York comeback

The light-rail revival so far hasn't been felt in New York, but now there are proposals for four LRT lines in the area.

RAILWAY AGE
GOODBYE TO ALL THIS?
AMTRAK UNDER SIEGE

Amtrak photos (clockwise) by Roy Blanchard, William D. Middleton, Shirley Burman, Roy Blanchard, Roy Blanchard, Shirley Burman. *Page 37.*

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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014 USPS 449-130, Vol. 186, No. 4

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years; all other countries $35 one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies $3 plus postage and handling, except special issues. Copyrighted © 1985.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

Inside

The truth about that "Golden Age"

LUTHER S. MILLER

At a time when much of American industry is scaling new peaks of profitability, the railroads are still scrambling in the foothills. It is comfortable territory, compared with the fiscal swamps of the '70s; but it is a long way from the dizzying heights that the railroads are depicted as occupying by those who want to see them slapped back into the chains of federal regulation.

Some of the richest reregulation rhetoric has come from National Coal Association President Carl E. Bagge. In Mr. Bagge's view, the Staggers Rail Act of 1980 "has been turned away from what Congress intended and has been distorted to recreate the 19th century's Golden Age of Railroading and its monopoly conditions." One result of this perversion of Congressional intent, says Mr. Bagge, has been railroad rates that are "much higher than costs plus reasonable profit."

As Mr. Bagge well knows, what Congress intended with passage of the Staggers Act (and said so explicitly) was to restore the railroads to revenue adequacy. The ICC subsequently determined that a railroad would be revenue adequate when its return on net investment equaled its cost of capital. On this basis, a fair return last year was judged to be around 15%.

The ICC reports periodically on how close the railroads have come to that benchmark. The latest report, covering the 12 months ended last Sept. 30, shows that the railroads collectively earned a return of 5.78%.

Boston & Maine's 16.83% return did exceed the "fair" threshold, but the ICC footnotes that as a fluke deriving from the fact that Guilford Industries' purchase price for the common stock of B&M "was considerably less than the railroad's net equity, necessitating a large write-down of railroad assets." Otherwise, this was the picture:

Southern District:	
Florida East Coast	0%
Illinois Central Gulf	2.46%
Seaboard System	7.13%
Southern	5.32%

Western District:	
Santa Fe	4.50%
Burlington Northern	9.50%
Chicago & North Western	6.04%
Milwaukee Road	1.70%
Denver & Rio Grande Western	4.00%
Duluth, Missabe & Iron Range	0%
Kansas City Southern	7.51%
Missouri-Kansas-Texas	1.66%
St. Louis Southwestern	2.13%
Soo Line	3.04%
Southern Pacific	1.58%
Union Pacific	4.36%
Western Pacific	0%

Eastern District:	
Baltimore & Ohio	6.03%
Bessemer & Lake Erie	5.28%
Chesapeake & Ohio	3.62%
Conrail	9.60%
Elgin, Joliet & Eastern	4.06%
Grand Trunk Western	0.10%
Norfolk & Western	7.04%
Pittsburgh & Lake Erie	0%

RAILWAY AGE

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Change of address should reach us six weeks in advance of next issue date. Send both old and new addresses with address label to Subscription Department, Railway Age, P.O. Box 530, Bristol, CT 06010 or call (203) 582-6546. Post Office will not forward copies unless you provide extra postage.

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ISSN 0033-8826/85 $2.00 + 0.00

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Market Outlook

Equipment

Conrail: Has adopted a 1985 capital budget of $557 million (about $30 million more than actual 1984 outlays). The new program includes $128 million for equipment (locomotives, freight cars and motor vehicles); $135 million for improvements (communications and signals, workshops and machinery, structures, freight terminals and computers); and $294 million for track (installation of 418 miles of cwr, 2.1 million crossties, and 632 switches, plus surfacing of 6,220 pass miles of track). In addition, Conrail will spend nearly $7 million for new equipment for Pennsylvania Truck Lines, a subsidiary that operates the railroad's TrailVan intermodal terminals.

Dow Chemical: Leased 200 5,800-cu-ft capacity covered hopper cars from Pullman Leasing. Built by Richmond Tank Car and equipped with Youngstown Steel Door pneumatic outlet gates, the cars are designed to handle plastic resins.

Massachusetts Bay Transportation Authority: Ordered an additional four rapid transit cars from UTDC (USA) Inc. at a cost of $1.030 million each. This brings MBTA's total order to 58 cars valued at $56 million (U.S.). They will be used on Boston's Red Line.

Public Service Company of Colorado: Placed an order with Bethlehem Steel's Freight Car Division at Johnstown, Pa., for "more than 130" Coalporter gondola cars. Work on the order will begin late in the second quarter. It is the first for the division since it completed an order in January for 135 Coalporters, mostly for the Grand River Dam Authority of Oklahoma.

Saudi Railways Organization: The Gregg Co. of Hackensack, N.J., will begin delivery of eight double-truck cabooses in April. They are being built in the U.S.

Union Pacific: Ordered 100 100-ton-capacity covered hoppers, for cement service, from Greenville Steel Car at a cost of $3.5 million.

Revenue freight carloadings

Commodity	Mar. 9 week	Mar. 2 week	Feb. 23 week	Feb. 16 week
Grain	22,384	24,253	21,957	24,275
Other farm products	3,385	4,057	3,564	3,643
Metallic ores	12,398	12,118	11,848	12,252
Coal	118,053	115,556	121,431	96,811
Crushed stone, gravel and sand	10,803	10,093	9,987	8,282
Nonmetallic minerals	11,022	12,467	10,135	11,434
Grain mill products	10,787	10,888	10,534	11,303
Food and kindred products	11,337	11,538	10,791	11,182
Primary forest products	12,839	12,498	13,544	12,349
Lumber and wood products except furniture	8,739	7,469	6,989	7,088
Pulp, paper and allied products	14,918	15,568	14,888	14,787
Chemicals and allied products	25,784	26,196	24,737	24,588
Petroleum products	4,408	4,537	4,646	4,824
Stone, clay and glass products	10,529	10,338	10,676	8,852
Coke	4,044	5,272	4,862	4,881
Metals and products	9,910	10,484	8,987	8,291
Motor vehicles and equipment	22,248	22,810	22,421	20,449
Waste and scrap materials	10,085	8,865	9,313	8,713
Forwarder and shipper assn. traffic	6,888	7,383	6,052	6,887
All other carloads	59,408	61,626	57,886	55,888
LCL traffic	175	177	153	124
Total Cars Loaded	398,478	394,948	394,222	358,047
% change from previous year	(3.8)	1.0	(2.1)	(10.7)

Estimated revenue ton-miles (billions)	1985	1984	% change
10 weeks	165.4	175.5	(5.8)

Piggyback loadings

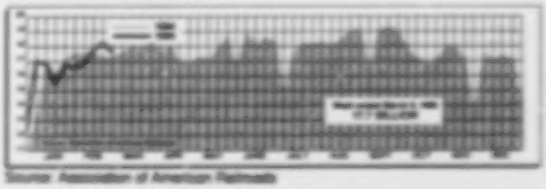
	Mar. 2 week	Feb. 23 week	Feb. 16 week	Feb. 9 week	Feb. 2 week
Trailers/containers*	51,822	55,120	55,157	54,494	56,037

Cumulative total, 9 weeks		% change from 1984
Trailers/containers	731,837	(4.2)

*The AAR has stopped reporting the weekly flatcar loadings figures. The increased use of longer trailers has made the figures increasingly less comparable to the past since many flatcars now carry only one trailer instead of two.

Rail freight traffic trends

Billion ton miles (Estimated)



Source: Association of American Railroads

Freight cars

	DELIVERED			ORDERED			ON ORDER AND UNDELIVERED		
	Feb. 1985	2 months 1985	2 months 1984	Feb. 1985	2 months 1985	2 months 1984	March 1, 1985	Average Backlog 1985	Average Backlog 1984
Built new by carbuilders	830	1,717	943	650	1,053	4,259	3,884	3,974	6,080
Built new in RR shops	0	336	0	0	0	0	70	70	0
Built new—total	830	2,053	943	650	1,053	4,259	3,954	4,044	6,080
Rebuilt	0	0	0	0	0	0	0	0	0
TOTAL	830	2,053	943	650	1,053	4,259	3,954	4,044	6,080
Locomotives (new and rebuilt)	25	49	48	N/A	N/A	N/A	237	244	83

Source: Transportation Div., AAR and American Railway Car Institute

Lines on Labor

BN: Charting a new course takes time

A giant corporation is a lot like a supertanker. It takes a long time to respond to the helm. It takes a long time, a long distance, to change course. Burlington Northern Railroad's helmsman, Chairman and Chief Executive Officer Walter A. Drexel, has been wanting to change course, and he has, in a physical sense. The executive headquarters of BN have been moved to Texas, the operating headquarters have been moved to Kansas, leaving a much-lesser presence in the old headquarters city, St. Paul. But Walter Drexel has also been wanting to change course in what's described as "corporate culture." And on that one, BN is still working to earn its marks, by its own admission.

GUS WELTY

"Corporate culture" is one of those buzz-phrases that the average working-stiff may not quite grasp. *Railway Age* called it "style" (*RA*, April 1984, p. 18) in commenting on BN's "culture" employee survey. Drexel describes it as "simply a term to describe the overall way things get done within the company." He talks of a decentralized, participative organization. Management in the new corporate culture, he says, "means behaving more like leaders than like bosses. This means we use persuasion as the primary tool for getting employees to do their best."

Corporate culture, he wrote in a recent issue of BN's employee publication, "relies on the concept of 'mutuality of interest' as the foundation for its success. The concept means that we recognize that employees will only do their best to achieve the company's objectives when they firmly believe that simultaneously they will be better off. Job security, improved compensation and benefits, and better morale will only occur when all of us are pulling together to provide our customers more reliable service at a lower cost than our competition."

You can't argue with that. Over the past many years, untold numbers of "Lines on Labor" columns have had the same theme. And, of course, "We're all in this together" has come to rank second only to "Employees are our most important asset" in any listing of business-management cliches.

Credit BN for asking employees in the first place, and then for making a response. Credit BN for going public with its recital of employee-suggested problems, and with its outline of how those problems are being addressed.

Old terms die hard

But, the supertanker syndrome does live. Survey results were in a long time ago and now, more than a year later, the story in *BN News* tells about what's being done. And people have suffered, emotionally if not financially, with transfers, with notification that when they leave their jobs will be abolished, with placement on "surplus" status. And, despite the emphasis on leadership as opposed to boss-ism, old terms apparently die hard: The story uses the words supervisor and subordinate in describing relationships between those who give the orders and those who take them. This, by the way, is not meant to imply that a company should go the weird route where everybody on the payroll is an associate with business cards that read "Associate-Track Laborer." It is meant to say that, euphemisms aside, the company that works best will be the company that emphasizes personal relationships even as it maintains the proper and necessary discipline.

People who work for BN have gone through a lot of changes, starting 15 years ago with the merger that created BN. And in no way is change bad, per se. For BN, change has meant, among other things, increased profit. For BN, change has meant, among other things, the prospect that employment has now been stabilized, moving with the economy but without the wrenching changes made by a management that saw a company as over-staffed.

Now, BN says it's doing, or going to do, a lot of things in terms of making this "corporate culture" work. BN is saying a lot about communicating. BN is saying that the "culture" will pass through.

BN's employees will be watching. So will other railroads. And, no matter what BN's top management may think, BN is a railroad, with whatever baggage that word may carry in terms of style or, if you prefer, culture.

What that means is simply that BN, any major railroad, is a supertanker. The difference is, maybe, that the tanker, a machine, eventually responds. But a railroad is people, first and foremost. And people can be hard to program.

Class 1 railroad employment

Employee Group	No. of employees, mid-month count February 1985	Percent of change February 1985 from February 1984	January 1985
Total—all employees	303,690	d 3.79	d .33
Executives, officials and staff assistants	13,744	2.13	1.64
Professional and administrative	58,596	d 8.20	d .58
Maintenance of way and structures	55,362	d 3.21	d 2.45
Maintenance of equipment and stores	58,879	d 5.82	d .22
Transportation (other than train, and engine)	20,612	1.06	d 1.72
Transportation (train and engine)	96,497	d 1.78	1.02

Source: ICC

REVENUES AND EXPENSES OF RAILWAYS

Fourth quarter figures of calendar year 1984

(Dollar figures are stated in thousands, i.e., with last three digits omitted)

		Operating revenues				Operating expenses														
						Way & structures			Equipment											
		Freight	Other	Total 1984	Total 1983	Total 1984	Total 1983	1984 Deprec.	Total 1984	Total 1983	1984 Deprec.	Total 1984	Total 1983	Operating Ratio 1984	Operating Ratio 1983	Income after fixed charges 1984	Income after fixed charges 1983	1984 Net Ry. operating income	Net income 1984	Net income 1983
Amtrak	3 mos.	—	181,107	181,107	175,955	58,448	95,391	20,501	100,026	85,303	20,245	398,610	398,228	220.09	226.32	(212,291)	(217,298)	(217,503)	(212,291)	(217,298)
	12 mos.	—	731,736	731,736	685,304	211,794	208,731	61,383	385,517	349,504	80,519	1,547,301	1,429,523	211.45	208.59	(791,081)	(787,142)	(815,565)	(791,081)	(787,142)
Atchison, Topeka & Santa Fe	3 mos.	[illegible]	[illegible]	557,431	[illegible]	[illegible]	[illegible]	14,734	[illegible]	134,075	[illegible]	512,129	[illegible]	91.37	95.56	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	12 mos.	[illegible]	[illegible]	2,308,444	2,091,143	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Baltimore & Ohio	3 mos.	233,278	9,762	243,040	257,459	47,744	52,572	9,922	63,288	59,179	7,476	244,225	246,751	100.48	95.84	2,116	15,451	6,410	5,974	12,726
	12 mos.	1,009,929	38,976	1,050,905	918,581	184,604	217,831	39,537	238,298	218,861	29,310	994,453	935,865	94.62	101.88	53,921	(3,587)	69,825	43,656	180
Bessemer & Lake Erie	3 mos.	12,454	[illegible]	[illegible]	15,755	4,144	[illegible]	[illegible]	671	[illegible]	[illegible]	13,777	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	12 mos.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4,714	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Boston & Maine	3 mos.	28,406	1,339	29,745	—	4,971	—	226	9,287	—	46	30,428	—	102.29	—	(156)	—	(909)	(156)	—
	12 mos.	119,103	5,950	125,053	—	18,265	—	1,414	37,287	—	208	118,947	—	95.11	—	7,856	—	6,403	7,856	—
Burlington Northern	3 mos.	[illegible]	21,187	1,110,113	[illegible]	171,739	171,469	[illegible]	[illegible]	193,736	[illegible]	[illegible]	[illegible]	79.39	84.72	[illegible]	[illegible]	[illegible]	[illegible]	117,758
	12 mos.	[illegible]	69,777	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	777,873	724,916	[illegible]	[illegible]	3,409,711	76.87	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chesapeake & Ohio	3 mos.	196,584	7,484	204,068	243,307	33,134	42,195	7,448	59,492	53,842	3,850	212,093	222,520	103.93	91.45	445	34,196	(8,250)	2,214	29,042
	12 mos.	1,012,690	37,784	1,050,474	949,237	140,969	102,645	31,641	243,647	209,088	14,720	908,906	876,912	86.52	92.38	204,446	71,823	79,453	142,346	46,926
Chicago & North Western	3 mos.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	51,442	4,139	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7,759	[illegible]	[illegible]
	12 mos.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8,491	[illegible]	[illegible]	[illegible]
Chicago, Milwaukee, St. Paul & Pac.	3 mos.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12 mos.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Conrail	3 mos.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	104,796	[illegible]	[illegible]	[illegible]	40,712	738,751	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	12 mos.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,879,437	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Delaware & Hudson	3 mos.	28,367	610	28,977	27,328	5,465	4,938	236	9,425	8,714	158	32,767	29,440	113.07	107.72	(3,979)	(4,406)	(3,762)	(3,979)	(4,406)
	12 mos.	117,428	5,774	123,202	108,354	21,462	19,974	860	38,045	32,337	738	128,521	114,295	104.31	105.46	(6,776)	(16,317)	(5,205)	(6,776)	(16,317)
Denver & Rio Grande Western	3 mos.	[illegible]	1,477	[illegible]	[illegible]	[illegible]	[illegible]	3,441	17,489	[illegible]	[illegible]	78,118	[illegible]	[illegible]	87.21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	12 mos.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Elgin, Joliet & Eastern	3 mos.	13,774	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,781	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	12 mos.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11,089	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7,663	[illegible]
Duluth, Missabe & Iron Range	3 mos.	14,202	698	14,900	21,873	7,826	7,976	1,562	4,564	2,358	44	18,134	19,244	121.70	87.98	2,833	5,300	(1,685)	2,597	3,162
	12 mos.	76,116	3,609	79,725	78,140	31,827	25,229	6,265	13,121	8,867	2,122	79,740	66,501	100.01	85.10	12,582	15,679	(3,819)	8,283	9,047
Florida East Coast	3 mos.	32,097	735	32,832	29,762	5,111	6,190	1,244	4,996	4,863	947	24,020	24,030	73.16	80.74	9,712	16,914	5,015	5,915	7,805
	12 mos.	119,261	2,218	121,479	104,776	17,840	21,809	4,630	19,831	16,907	3,767	89,560	85,074	73.72	81.19	45,005	67,896	13,779	38,865	38,575

Grand Trunk Western	3 mos.	80,910	8,857	89,767	81,598	9,373	7,637	1,840	17,520	15,288	1,498	82,375	84,465	91.78	104.95	8,044	(4,888)	8,432	7,085	(4,104)
	12 mos.	328,447	12,672	341,119	227,288	40,210	30,180	6,777	74,875	52,059	8,284	301,938	337,236	97.05	104.30	3,287	(14,888)	14,469	7,330	(10,188)
Illinois Central Gulf	3 mos.	211,157	18,640	229,797	217,513	22,339	27,100	11,546	73,360	100,452	4,286	216,938	217,016	94.40	99.77	9,916	(203)	14,159	7,054	(1,930)
	12 mos.	877,099	77,589	954,688	874,187	111,259	116,252	46,310	263,881	397,373	19,033	892,102	869,975	93.44	99.52	71,787	(17,961)	53,800	62,363	(20,312)
Kansas City Southern	3 mos.	79,297	4,047	83,344	73,948	11,343	10,615	2,799	16,832	18,349	3,178	67,308	61,525	80.63	88.20	14,768	5,788	10,414	3,891	3,218
	12 mos.	316,116	15,344	331,460	306,041	47,736	51,881	12,910	78,251	71,137	20,099	277,042	287,206	83.58	87.34	47,437	27,844	38,787	38,967	20,989
Missouri-Kansas-Texas	3 mos.	59,771	3,240	63,011	60,371	12,821	12,394	3,347	13,952	14,259	1,734	60,880	58,244	96.31	96.47	(877)	(1,815)	3,434	(77)	(1,200)
	12 mos.	261,245	14,319	275,564	226,741	52,985	39,500	11,304	65,762	54,977	6,727	230,389	212,336	94.13	92.82	7,057	5,260	18,403	7,857	8,075
Missouri Pacific	3 mos.	426,418	11,810	438,228	414,740	68,279	74,519	12,198	99,096	96,188	17,813	419,815	389,080	95.72	92.28	25,769	25,752	16,675	23,296	18,764
	12 mos.	1,748,360	46,877	1,795,237	1,662,036	262,484	280,900	47,850	386,059	378,976	71,445	1,608,604	1,538,861	89.60	91.21	177,887	87,211	148,048	128,916	67,049
Norfolk & Western	3 mos.	347,657	16,169	363,826	407,598	68,804	75,550	11,835	64,434	66,577	11,587	321,116	326,189	88.26	80.02	81,240	103,853	17,864	46,017	61,662
	12 mos.	1,647,528	67,030	1,714,558	1,526,709	91,156	330,286	44,725	317,863	273,553	52,374	1,386,576	1,326,314	80.87	86.87	446,959	262,503	167,775	263,918	165,719
Pittsburgh & Lake Erie	3 mos.	8,351	383	8,734	13,179	2,870	4,902	309	2,670	4,800	309	11,867	14,401	135.88	109.27	(2,720)	(4,921)	(2,626)	(2,720)	(4,522)
	12 mos.	48,239	2,076	50,315	43,201	12,493	19,110	1,299	12,493	18,119	1,436	54,469	57,849	108.26	133.86	(11,887)	(23,078)	(3,849)	(11,086)	(22,085)
St. Louis Southwestern	3 mos.	103,069	1,919	104,988	96,312	13,741	18,176	4,157	26,366	22,048	6,064	94,265	92,429	89.78	95.86	10,777	14,138	7,096	18,150	5,118
	12 mos.	429,755	6,456	436,211	387,761	55,349	57,172	16,733	110,242	89,706	23,384	394,047	343,661	90.33	93.45	61,434	39,216	25,316	44,586	32,171
Seaboard System	3 mos.	647,487	16,919	664,406	662,790	86,792	113,881	14,547	167,401	161,891	33,798	589,271	600,191	88.69	91.94	72,231	62,841	51,372	46,297	30,796
	12 mos.	2,684,612	62,181	2,746,793	2,471,915	344,447	427,148	63,327	676,939	631,729	70,380	2,364,880	2,322,441	86.08	93.95	378,322	124,976	264,774	244,316	98,071
Soo Line	3 mos.	75,992	1,880	77,872	78,365	15,001	13,605	3,044	19,023	18,017	1,995	75,190	69,684	96.55	88.92	3,850	9,511	1,414	2,379	5,875
	12 mos.	308,215	7,309	315,524	293,230	61,628	60,496	11,615	72,658	66,438	8,042	295,262	274,054	93.57	93.46	26,662	20,672	10,748	16,341	12,931
Southern	3 mos.	435,158	10,785	445,943	403,205	43,059	53,992	18,861	77,085	83,787	18,261	326,290	332,980	73.16	82.90	113,863	69,707	66,744	52,467	39,458
	12 mos.	1,754,324	41,083	1,795,407	1,602,795	234,412	249,867	76,384	349,029	325,820	75,383	1,408,251	1,358,290	78.32	84.74	397,636	230,118	226,407	201,125	136,538
Southern Pacific	3 mos.	520,709	16,923	537,632	501,557	67,965	117,448	20,779	147,224	141,925	21,766	530,515	568,674	98.67	113.38	41,939	(63,140)	19,533	54,356	(25,394)
	12 mos.	2,122,171	66,392	2,188,563	1,963,789	239,908	386,456	86,038	638,734	553,703	84,831	2,172,973	2,125,347	99.28	108.22	86,092	(138,672)	66,697	137,199	(43,416)
Union Pacific	3 mos.	481,908	5,510	487,418	478,754	84,541	82,462	17,228	106,807	99,932	23,098	440,025	411,927	90.27	86.04	48,508	61,680	31,068	32,765	39,847
	12 mos.	1,896,721	24,139	1,920,860	1,808,311	289,479	364,622	67,649	430,281	370,908	93,888	1,735,940	1,602,816	89.85	88.54	183,764	184,263	134,067	122,886	118,760
Western Pacific	3 mos.	29,930	753	30,683	32,109	6,754	8,861	849	8,921	9,964	1,736	40,297	43,474	131.33	135.39	(7,733)	(11,731)	(1,317)	574	(4,241)
	12 mos.	143,676	3,064	146,740	147,362	27,385	27,424	3,096	33,302	40,727	7,086	163,315	175,915	111.29	119.37	(23,621)	(26,550)	326	(6,818)	(10,306)

Source: Interstate Commerce Commission

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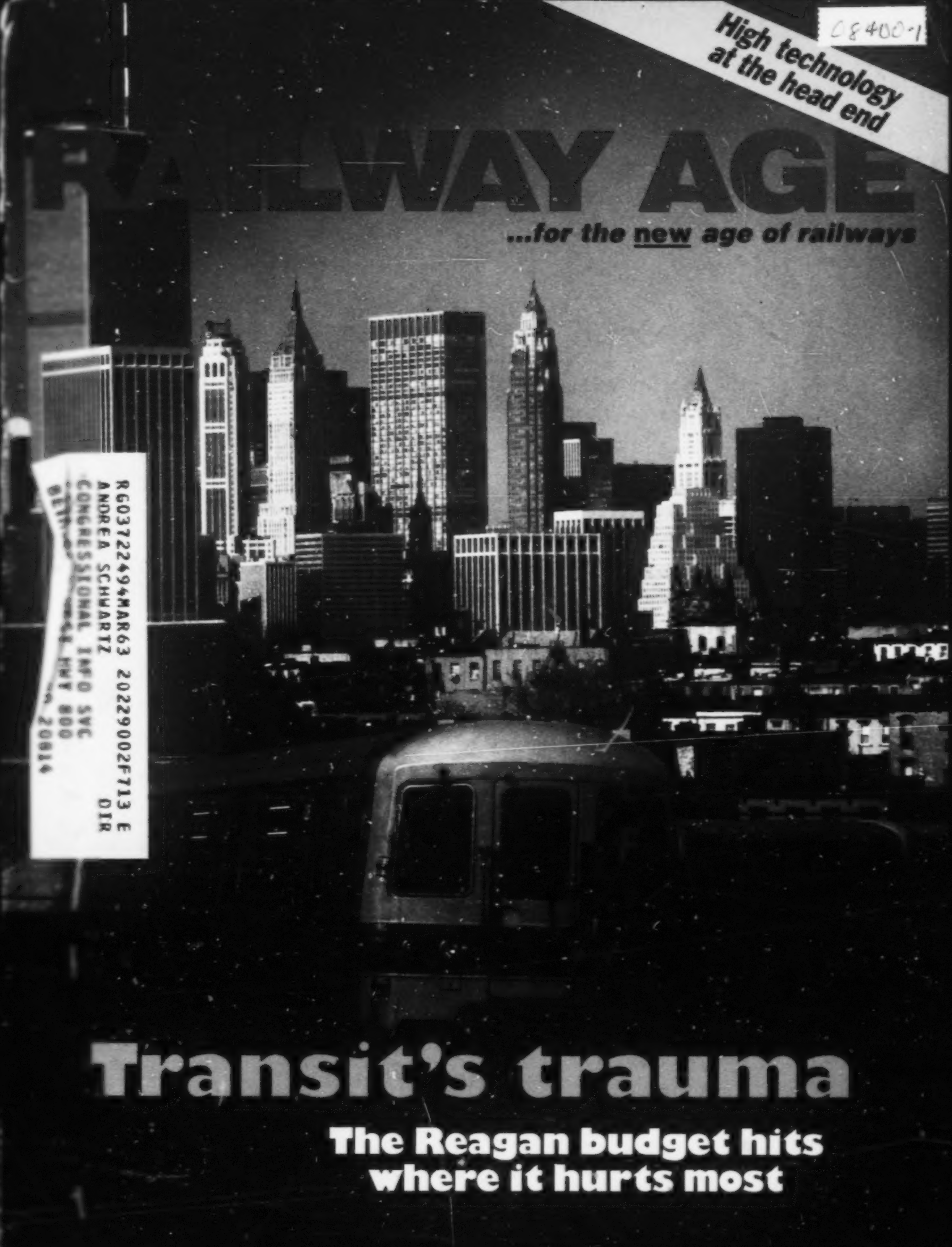

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Transit's trauma

The Reagan budget hits where it hurts most

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May 1985

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Despite severely reduced business levels, the diesel-electric builders have invested heavily in a new generation of locomotives that could dramatically change the power picture.

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Already accepted in Europe, ac traction may soon find applications in North America, in both passenger and freight railroading. Tests are already under way.

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The Reagan budget hits where it hurts most

With the lower Manhattan skyline in the background, an Independent Line "F" train is photographed in Brooklyn by *Railway Age* Photo Editor Roy H. Blanchard. *Page 58.*

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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014 USPS 440-130, Vol. 186, No. 5

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years, all other countries $35 one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies $3 plus postage and handling, except special issues. Copyrighted © 1985.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT. 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

Market Outlook

Equipment

Massachusetts Bay Transportation Authority: General Electric has awarded contracts exceeding $1.3 million to Stone Nycal Corp. for overhauling 75 car sets of Stone Safety air conditioning systems as well as air compressors, couplers, yokes, and draft gear arrangements, as part of an MBTA rehabilitation program.

- A $2.5 million contract has been awarded to Buckeye Steel Castings for 108 GSI-designed trucks for 54 cars that Can-Car Rail is building for MBTA.

Santa Fe: Ordered LOCOTROL II remote locomotive control systems valued at $2.29 million from the Harris Controls and Composition Division of Harris Corp. Advanced versions of the original LOCOTROL, which has been in use for 20 years, the new systems will be installed on locomotives being rebuilt at Cleburne, Tex., and destined for unit-train service. About 50 ATSF locomotives are equipped with the Harris systems.

Trailer Train: Awarded a contract to Bethlehem Steel's Freight Car Division for modification of 250 low-level, 89-foot flatcars into auto-hauling cars.

Union Pacific System: Ordered 60 C36-7, 3,750-hp diesel-electric units from General Electric at a cost of $65.1 million. Delivery is to begin in this year's fourth quarter.

- UP has placed an order with Thrall Car for 426 fully enclosed tri-level and bi-level autoracks at a cost of $13.4 million. With completion of delivery, UP System's rack fleet will number 5,700 cars.

Facilities

Zambia: Will apply a $20-million International Development Association credit toward an $83.1-million railway modernization program that calls for track rehabilitation or replacement, provision of a new radio signaling and telecommunications system, and overhaul of the equipment fleet.

Revenue freight carloadings

Commodity	Apr. 6 week	Mar. 30 week	Mar. 23 week	Mar. 16 week
Grain	20,275	22,350	23,173	24,832
Other farm products	2,883	3,169	3,345	3,834
Metallic ores	13,080	13,908	14,880	11,833
Coal	107,403	119,365	123,229	119,652
Crushed stone, gravel and sand	12,741	11,763	11,949	10,596
Nonmetallic minerals	9,107	11,560	11,901	11,705
Grain mill products	9,203	10,931	10,374	10,665
Food and kindred products	10,823	11,384	10,942	11,639
Primary forest products	11,698	12,532	12,611	12,912
Lumber and wood products except furniture	6,476	7,881	6,932	7,147
Pulp, paper and allied products	13,964	14,927	14,448	14,631
Chemicals and allied products	24,753	27,423	27,344	28,183
Petroleum products	4,142	4,878	4,868	4,877
Stone, clay and glass products	10,690	11,261	11,398	11,237
Coke	5,284	5,218	4,841	5,310
Metals and products	8,998	9,922	9,430	9,664
Motor vehicles and equipment	19,333	22,636	22,209	22,842
Waste and scrap materials	8,540	9,973	10,148	10,536
Forwarder and shipper assn. traffic	6,280	6,953	6,785	6,916
All other carloads	57,531	58,640	58,726	59,039
LCL traffic	131	147	139	158
Total Cars Loaded	**364,666**	**397,521**	**399,563**	**398,666**
% change from previous year	(8.9)	(4.6)	(1.1)	(2.8)

Estimated revenue ton-miles (billions)	1985	1984	% change
14 weeks	237.0	249.0	(4.8)

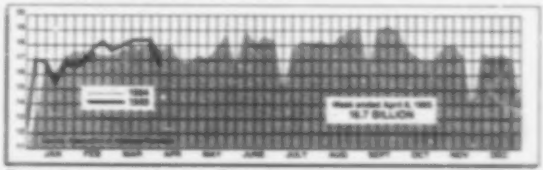
Piggyback loadings

	Mar. 30 week	Mar. 23 week	Mar. 16 week	Mar. 9 week
Trailers/containers	90,197	87,343	88,394	88,926

Cumulative total, 13 weeks		% change from 1984
Trailers/containers	1,085,268	(4.2)

Rail freight traffic trends

Billion ton miles (Estimated)



Source: Association of American Railroads

Freight cars

	DELIVERED			ORDERED			ON ORDER AND UNDELIVERED		
	March	3 months		March	3 months		April 1,	Average Backlog	
	1985	1985	1984	1985	1985	1984	1985	1985	1984
Built new by carbuilders	868	2,585	1,837	1,553	2,606	5,472	4,559	4,169	6,375
Built new in RR shops	0	336	0	0	0	0	70	70	0
Built new—total	**868**	**2,921**	**1,837**	**1,553**	**2,606**	**5,472**	**4,629**	**4,239**	**6,375**
Rebuilt	0	0	0	0	0	0	0	0	0
TOTAL	**868**	**2,921**	**1,837**	**1,553**	**2,606**	**5,472**	**4,629**	**4,239**	**6,375**
Locomotives (new and rebuilt)	48	97	76	N/A	N/A	N/A	273	254	86

Source: Transportation Div., AAR and American Railway Car Institute

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A bum rap for Miami Metrorail

June 1985

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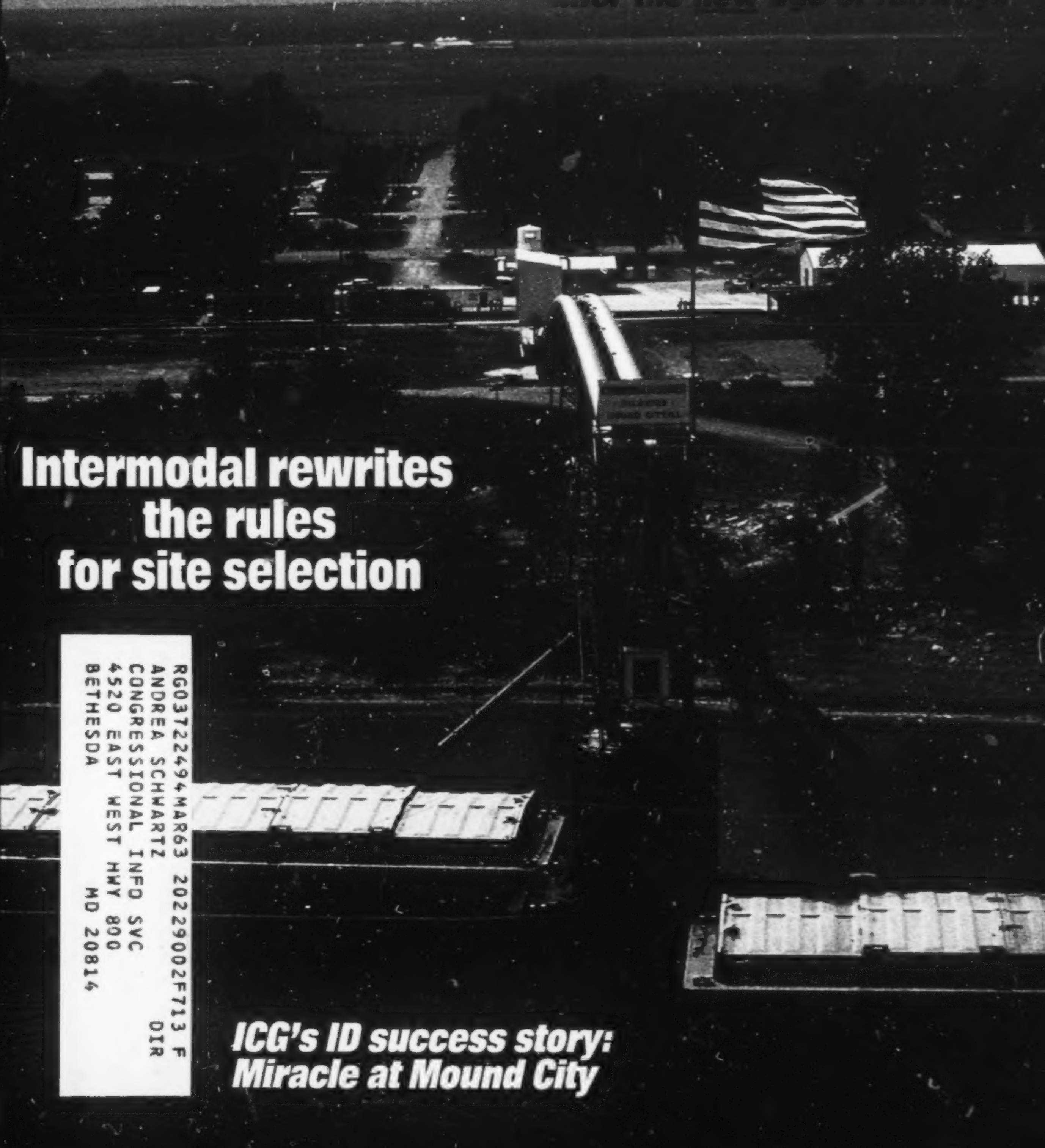

Intermodal rewrites the rules for site selection

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ICG's ID success story: Miracle at Mound City

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Rail-barge transloading facility at Mound City, Ill. Illinois Central Gulf photo. ***Page 36.***

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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014

USPS 449-130, Vol. 186, No. 6

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years; all other countries $35 one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies $3 plus postage and handling, except special issues. Copyrighted © 1985.

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Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT. 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

Market Outlook

Equipment

CP Rail: Is acquiring 150 100-ton ballast cars from National Steel Car at a cost of approximately $9 million (Canadian).

Mali Railway: Will place orders in Canada for 100 freight cars and eight locomotives valued at approximately $20 million (Canadian). CANAC consultants, under a $1.9 million contract, will act as Mali Railway's purchasing agent and quality control inspector and will also provide technical aid in training, equipment maintenance, stores management and general management.

Metro-North Commuter Railroad: Awarded a $2-million contract to Chrome Locomotive Inc. for overhaul and modification of three Budd rail diesel cars with an option for five additional cars at a cost in excess of $3 million.

Peoples Republic of China: The Ministry of Railways has placed an order with the General Electric Co. for an additional 200 diesel-electric locomotives. These will join a fleet of 220 locomotives shipped by GE to China last year under a 1983 contract. Value of the two orders is estimated at more than $450 million.

Richmond, Fredericksburg & Potomac: Awarded a $1.5-million contract to Chrome Locomotive Inc. for the rebuilding of four switching locomotives and the construction of two tractive effort boosters.

Facilities

Maryland Mass Transit Administration: Awarded a four-year construction management contract to a joint venture that includes Daniel, Mann, Johnson & Mendenhall and Raymond Kaiser Engineers Inc. The contract is for systems construction management on the 6-mile Section B of Baltimore's Metro.

UP System: Expects to open a new $7.1-million auto loading facility at the Port of Portland in August. Including a 40-acre area for storage and sorting, the facility will connect with UP's existing yard.

Revenue freight carloadings

Commodity	May 11 week	May 4 week	Apr. 27 week	Apr. 20 week
Grain	16,482	17,826	18,321	19,982
Other farm products	3,405	3,575	3,631	3,857
Metallic ores	17,378	19,491	16,397	15,556
Coal	114,011	111,757	114,687	117,091
Crushed stone, gravel and sand	13,817	13,706	13,526	13,434
Nonmetallic minerals	11,568	12,035	11,421	11,054
Grain mill products	10,036	10,117	9,974	10,475
Food and kindred products	11,038	11,214	11,469	11,491
Primary forest products	11,717	11,991	11,147	11,575
Lumber and wood products except furniture	7,385	7,843	8,365	7,777
Pulp, paper and allied products	13,521	14,229	14,346	13,868
Chemicals and allied products	25,757	25,902	26,611	27,330
Petroleum products	4,490	4,577	4,500	4,641
Stone, clay and glass products	11,542	11,509	11,380	11,538
Coke	4,916	5,432	5,602	5,469
Metals and products	8,719	9,766	9,860	8,791
Motor vehicles and equipment	22,160	22,299	23,518	23,257
Waste and scrap materials	8,622	9,111	9,293	9,322
Forwarder and shipper assn. traffic	6,709	6,666	6,414	6,445
All other carloads	58,633	59,514	58,772	57,393
LCL traffic	159	143	125	125
Total Cars Loaded	382,065	388,763	389,358	386,471
% change from previous year	(2.8)	(3.7)	(1.1)	0.8

Estimated revenue ton-miles (billions)	1985	1984	% change
19 weeks	324.8	337.3	(3.7)

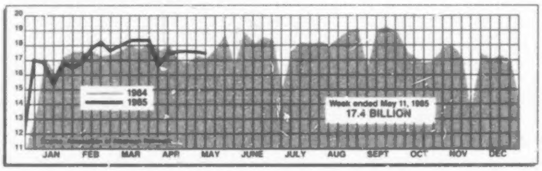
Piggyback loadings

	May 4 week	Apr. 27 week	Apr. 20 week	Apr. 13 week
Trailers/containers	86,048	85,284	85,839	81,707

Cumulative total, 18 weeks		% change from 1984
Trailers/containers	1,511,043	(4.0)

Rail freight traffic trends

Billion ton miles (Estimated)



Source: Association of American Railroads

Freight cars

	DELIVERED			ORDERED			ON ORDER AND UNDELIVERED		
	April	4 months		April	4 months		May 1,	Average backlog	
	1985	1985	1984	1985	1985	1984	1985	1985	1984
Built new by carbuilders	979	3,564	2,372	816	3,422	6,144	4,396	4,559	6,742
Built new in RR shops	0	336	0	0	0	0	70	70	0
Built new—total	979	3,900	2,372	816	3,422	6,144	4,466	4,629	6,742
Rebuilt	0	0	0	0	0	0	0	0	0
TOTAL	979	3,900	2,372	816	3,422	6,144	4,466	4,629	6,742
Locomotives (new and rebuilt)	39	135	115	N/A	N/A	N/A	262	256	127

Source: Transportation Div., AAR and American Railway Car Institute

Lines on Labor

One for all and all for one? No longer, maybe

For railroads and rail unions, national handling of major issues has been a way of life. Wages, benefits, basic work rules have all been negotiated on an industry-wide basis. Agreements have been applied across-the-board, so that, for instance, a locomotive engineer working out of Amarillo had the same pay, benefits and rules as an engineer working out of Chicago. In large part, that's the way things are now. But a valid question is: How long will things stay this way?

GUS WELTY

Coalition bargaining or national handling has bloomed and faded in other industries. Bargaining has become fragmented in a number of basic manufacturing industries. The steel-industry coalition, which once had more than a dozen companies represented, was down to five when the whole thing broke up a few weeks ago. With motor-carrier deregulation, the Teamsters' master agreement with the industry became something of a joke. Airlines (like railroads, playing by the rules of the Railway Labor Act), have traditionally bargained individually.

Railroads are close to being the last bastion of national-handling. But splits have been developing, as a few carriers— mostly small and relatively less-than-well-to-do—have opted out. More splits could come.

Smaller roads have long complained that they were being saddled with agreements that burdened them more than their larger (and richer) brethren, so their splitting is not hard to understand.

But the world has now changed quite a bit for the majors, because of mergers and deregulation.

Mergers (and diversification) have produced larger and stronger companies, companies better able to go it alone in combat with rail unions, themselves fragmented.

Deregulation has brought true competition to rail transportation, and in certain ways it has done something to the old feeling of one-for-all-and-all-for-one, the old feeling that if railroads didn't hang together they would surely hang separately. Increased productivity is the goal of every railroad, especially where labor costs and service considerations are concerned. And questions can be raised as to whether "increased productivity" for individual railroads can best be addressed in common bargaining.

Increased productivity, of course, bears directly on the ultimate goal of every railroad, which is to be the so-called low-cost carrier. That's a vital interest especially to marketing and sales people, since cost control has become far more important under deregulation, in terms of competition within the rail-road industry and competition with deregulated—and often non-union—motor carriers.

Not long ago, an industry association brought together high-level marketing/sales officers from five major railroads to talk about dereg and all its implications. Each leaned strongly in the direction of do-it-yourself bargaining as offering the best potential for gaining the kinds of productivity improvements that would enhance low-cost positioning in the marketplace.

The industry has been blessed with a series of capable chief negotiators, such men as Doc Wolfe and Bill Dempsey and now Chuck Hopkins. So the question about the future doesn't have to do with who's driving the car but with the appropriateness of the vehicle itself—i.e., one does not take a Seville into four-wheel-drive country.

If—and it is a big "if"—national handling should go, though, then what happens?

For one thing, on both sides, the responsibility for making agreements would be in a more clear focus: There would not be the diffusion of agreement-by-committee.

For another, pressures would increase, on both sides, but railroads would have an edge: Every major railroad has a cadre of capable labor-relations officers, many of them experienced in national-handling—but the labor organizations might well have a problem, with limited headquarters resources and with individual general chairmen schooled mainly in negotiating on local issues.

For a third, the search for a "pattern" could turn into a real stampede, with labor trying to cut out a straggler from the herd to feast on him and with the railroads trying to impose whatever the strongest could win.

The prospects are sobering for both sides, but maybe more so for the unions. Railroads today are stronger than they have been for many years. Unions are weaker.

In a very real sense, through merger and deregulation, railroads have found themselves. There's a new vigor out there, and it could translate broadly. Railroads have found themselves. Rail labor is still looking.

Class 1 railroad employment

Employee Group	No. of employees, mid-month count March 1985	Percent of change March 1985 from March 1984	Percent of change March 1985 from February 1985
Total—all employees	303,310	d 4.77	d .13
Executives, officials and staff assistants	13,761	2.47	.12
Professional and administrative	57,893	d 6.95	d 1.20
Maintenance of way and structures	56,340	d 3.88	d 1.77
Maintenance of equipment and stores	58,443	d 6.73	d .74
Transportation (other than train and engine)	20,486	d 4.65	d .61
Transportation (train and engine)	96,387	d 3.70	d .11

Source: ICC

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RAILWAY AGE

...for the new age of railways

Buffalo markets a new brand of transit

State-of-the-industry

Mixed signals at midyear

CP Rail: 100 years old and growing

High-tech railroading

What computers can (and can't) do

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RAILWAY AGE

...for the new age of railways

July 1985

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Service and high-tech industries are growing; the farms and factories that produce carload traffic aren't—and that pretty much tells the story so far this year.

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The potential for useful application of computer technology is almost limitless—but as one expert warns, "There is also great potential for making mistakes."

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79 Small is beautiful? Just ask Harold Cragg

Here's what a one-man sales force accomplished with a new product (in this case a battery-charger) that "worked well and did not fail."

88 NFTA: Revenue trains roll in Buffalo

Thirty-five years after the last streetcars vanished from Buffalo streets, the Niagara Frontier Transportation Authority brought rail back—and the city celebrated.

COVER: Photo by Conny Johannesson.

95 High-speed forces regroup

Two recent meetings have underscored the let's-get-serious-and-get-on-with-it spirit that now guides the efforts of high-speed passenger rail advocates.

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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014

USPS 449-100, Vol. 186, No. 7

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S., possessions, Canada and Mexico: [illegible] one year, [illegible] two years; all other countries [illegible] one year. All other subscriptions in the U.S., Canada and Mexico: [illegible] one year; all other countries: [illegible] one year. All subscriptions payable in advance. Single copies [illegible] plus postage and handling, except special issues. Copyrighted © 1985.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box [illegible], Bristol, Conn. 06010.

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX [illegible], BRISTOL, CONN. 06010.

Inside

A case of the blahs—and worse

LUTHER S. MILLER

John J. Schmidt, chairman and CEO of the Santa Fe Southern Pacific Corp., calls it a "selective depression." Walter J. Drexel, chairman, president and CEO of the Burlington Northern, says BN has been going through a "mild recession." Whatever you call it, the railroads at midyear '85 are experiencing a case of the blahs. At a time when the national economy as a whole is growing, at a rate of around 3%, railroad traffic is off around 4%. Why this is so, and what it portends in the short term for earnings performance and capital investment, is the subject of the story that begins on p. 38.

"The blahs" is hardly the term to describe the state of mind of the freight-car builders. They continue to be mired in a depression deeper than anyone can remember, and right now the most optimistic of them see no way out of the slump. In Chicago a couple of weeks ago, the forecasting committee of the American Railway Car Institute held its semi-annual session. Eight carbuilders and nine component suppliers submitted their forecasts for deliveries and orders for 1985 and 1986. This is what they came up with (and as you read, keep in mind that it wasn't long ago that deliveries were in the 80-90,000-cars-a-year range):

Freight-car Forecast

(8 carbuilders)

	Deliveries		Orders	
	1985	1986	1985	1986
Average	12,300	15,900	13,000	16,900
Median	11,900	14,000	12,400	15,000
Range	11,000-15,000	13,000-23,000	10,000-17,000	14,000-25,000

(9 component suppliers)

	Deliveries		Orders	
	1985	1986	1985	1986
Average	12,500	17,300	14,200	20,200
Median	13,500	16,700	13,500	20,000
Range	7,200-15,000	8,200-23,000	8,000-16,000	9,500-28,000

If this is bad news for the carbuilders, it's good news for the railroads. The depressed car market means, among other things, that the carriers are getting dramatically increased utilization out of their existing fleet. Mergers have been an important factor. The trend toward fast-turnaround unit trains is another. A post-Staggers breed of managers who are attuned as never before to asset management (and who, thanks to deregulation, now have the tools to manage) have made their own contribution to the carbuilders' woes.

The reduced need for new cars also means that the railroads can put their investment dollars in areas that were long shortchanged. Out of record capital outlays of $4.3 billion last year, $3.5 billion went into track and structures. Not many years ago the T&S side was getting less than half of total capital dollars.

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Change of address should reach us six weeks in advance of next issue date. Send both old and new addresses with address label to Subscription Department, Railway Age, P.O. Box 530, Bristol, CT 06010 or call (203) 582-9546. Post Office will not forward copies unless you provide extra postage.

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ISSN 0033-8826/85 $2.00 + 0.00

Member of

Market Outlook

Facilities

Brazil: A World Bank loan of $200 million will help finance a $422-million railway modernization program. A main project will be the rehabilitation of about 780 miles of track in the Goias-Minas Gerais and Parana export corridors, where traffic control and telecommunications systems will be improved, yards and maintenance shops rehabilitated, and intermodal facilities constructed for the transfer of grain and grain products from rail to sea.

Chessie System: Has completed a new ore pier facility at Curtis Bay in Baltimore for the transfer of import bulk commodities, such as bauxite ore and magnesite, from ships to covered hopper cars. The new facility features computerized weighing and has a loading rate of 300 tons per hour.

Conrail: A $10.7-million program to upgrade CR's 200-mile Boston line includes installation of 30.1 miles of cwr, insertion of 68,580 crossties, surfacing of 207.4 pass-miles, and rehabilitation of 17 switches and six grade crossings.

Southeastern Michigan Transportation Authority: A $2.3-million contract has been awarded to Honeywell for installation of a DeltaNet Station Communication and Data Acquisition System for the Detroit Downtown People Mover System being developed by UTDC.

Equipment

CN Rail: Placed orders for work and shop equipment worth almost $2.5 million (Canadian). Woodings-Railcar Limited of Lancaster, Ont., and Fairmont Railway Motors Ltd. of Mississauga will supply 116 track motor cars valued at more than $1.2 million. Included are two-seat cars for track inspection and six-seat section cars for transporting work crews. Blast Cleaning Products of Oakville, Ont., won a contract of similar value to manufacture and install a blast and painting facility at Transcona Shops in Manitoba. The system includes paint spray booths and convection-type drying ovens.

Revenue freight carloadings

Commodity	June 15 week	June 8 week	June 1 week	May 25 week
Grain	22,745	22,273	19,294	18,468
Other farm products	4,156	4,200	3,658	3,598
Metallic ores	[illegible],330	18,204	15,965	20,241
Coal	118,223	118,900	102,378	119,643
Crushed stone, gravel and sand	13,346	14,288	11,706	13,172
Nonmetallic minerals	11,125	11,998	10,945	10,714
Grain mill products	10,353	10,305	8,873	10,166
Food and kindred products	10,994	10,943	9,880	10,946
Primary forest products	11,973	11,914	10,886	11,981
Lumber and wood products except furniture	7,614	7,545	7,102	7,979
Pulp, paper and allied products	13,536	13,761	14,155	14,034
Chemicals and allied products	22,324	23,265	21,236	24,080
Petroleum products	5,056	4,630	4,041	4,775
Stone, clay and glass products	10,951	11,550	10,343	11,522
Coke	4,769	4,631	4,653	5,123
Metals and products	9,048	9,613	9,641	9,341
Motor vehicles and equipment	22,345	22,261	18,532	22,128
Waste and scrap materials	8,613	8,241	7,419	8,504
Forwarder and shipper assn. traffic	6,375	6,142	5,294	6,288
All other carloads	57,768	58,075	51,504	58,009
LCL traffic	120	142	134	159
Total Cars Loaded	386,702	392,877	347,929	391,848
% change from previous year	(4.0)	(6.3)	(6.6)	(7.3)

Estimated revenue ton-miles (billions)	1985	1984	% change
24 weeks	412.0	429.0	(3.7)

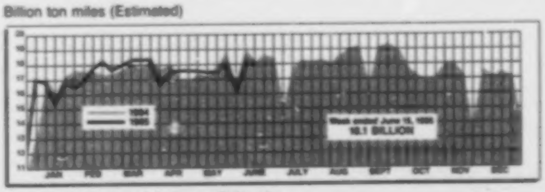
Piggyback loadings

	June 8 week	June 1 week	May 25 week	May 18 week	May 11 week
Trailers/containers	89,161	76,168	87,189	84,998	87,111

Cumulative total, 23 weeks		% change from 1984
Trailers/containers	1,936,170	(3.5)

Rail freight traffic trends

Billion ton miles (Estimated)



Source: Association of American Railroads

Freight cars

	DELIVERED			ORDERED			ON ORDER AND UNDELIVERED		
	May	5 months		May	5 months		June 1,	Average Backlog	
	1985	1985	1984	1985	1985	1984	1985	1985	1984
Built new by carbuilders	896	4,460	3,127	593	4,015	7,445	4,093	4,199	6,318
Built new in RR shops	70	406	0	0	0	0	0	56	0
Built new—total	966	4,866	3,127	593	4,015	7,445	4,093	4,255	6,318
Rebuilt	0	0	0	0	0	0	0	0	0
TOTAL	966	4,866	3,127	593	4,015	7,445	4,093	4,255	6,318
Locomotives (new and rebuilt)	58	193	131	N/A	N/A	N/A	284	262	147

Source: Transportation Div., AAR and American Railway Car Institute

REVENUES AND EXPENSES OF RAILWAYS

First quarter figures of calendar year 1985

(Dollar figures are stated in thousands, i.e., with last three digits omitted)

		Operating revenues				Operating expenses														
						Way & structures			Equipment					Operating Ratio		Income after fixed charges		1985 Net Ry. operating income	Net Income	
		Freight	Other	Total 1985	Total 1984	Total 1985	Total 1984	1985 Deprec.	Total 1985	Total 1984	1985 Deprec.	Total 1985	Total 1984	1985	1984	1985	1984		1985	1984
Amtrak	3 mos.	—	175,544	175,544	159,405	62,658	66,820	20,687	96,771	90,446	20,342	407,148	386,200	231.93	242.27	(225,399)	(220,138)	(231,604)	(225,399)	(220,138)
Atchison, Topeka & Santa Fe	3 mos.	537,512	11,592	549,104	581,699	91,542	85,203	14,370	130,711	141,785	23,624	524,364	533,077	95.49	91.64	34,293	47,005	18,251	27,569	31,651
Baltimore & Ohio	3 mos.	254,864	10,139	265,003	265,356	46,262	47,162	10,193	69,741	59,371	7,280	259,916	251,567	98.08	94.80	6,246	11,662	8,839	6,513	8,427
Boston & Maine	3 mos.	27,597	1,199	28,796	31,181	4,106	4,083	416	8,990	9,492	69	28,560	29,802	99.18	95.57	917	1,998	308	917	1,998
Burlington Northern	3 mos.	1,034,484	21,112	1,055,596	1,124,018	172,156	151,258	42,297	187,681	197,945	16,624	861,847	902,257	81.64	80.27	199,042	241,472	113,420	118,703	139,805
Chesapeake & Ohio	3 mos.	224,575	5,868	230,443	247,937	36,444	38,546	8,942	92,467	97,917	3,747	211,611	230,230	91.81	92.86	30,498	29,283	8,193	26,000	20,703
Chicago & North Western	3 mos.	178,396	26,238	204,634	232,604	40,265	37,181	7,056	40,104	56,930	4,121	207,296	222,074	101.30	95.65	(14,889)	1,608	(712)	(12,916)	1,375
Conrail	3 mos.	759,781	28,891	788,672	840,704	130,398	131,979	22,676	196,898	198,469	30,396	742,966	755,861	94.20	89.91	64,673	90,910	34,083	64,673	90,990
Delaware & Hudson	3 mos.	25,758	542	26,300	30,591	4,979	4,943	282	8,406	9,420	162	29,288	31,829	111.36	104.04	(3,432)	(1,864)	(2,866)	(3,432)	(1,864)
Denver & Rio Grande Western	3 mos.	83,673	1,345	85,018	88,215	14,127	13,843	3,460	16,660	16,984	3,365	76,897	80,776	90.45	91.57	9,312	4,814	4,916	8,898	3,071
Elgin, Joliet & Eastern	3 mos.	14,341	6,366	20,707	27,557	3,071	3,110	596	3,257	3,201	2,013	20,323	22,866	98.14	82.97	1,820	5,662	(301)	1,135	3,286
Florida East Coast	3 mos.	30,755	573	31,328	31,174	4,770	4,364	1,236	5,562	5,372	989	22,734	22,485	72.56	72.12	11,771	11,865	3,361	6,538	6,946
Grand Trunk Western	3 mos.	85,294	3,508	88,802	84,553	10,569	10,142	1,656	17,167	19,401	1,543	87,237	83,512	98.23	98.76	306	(443)	1,777	1,374	1,067
Illinois Central Gulf	3 mos.	223,145	18,715	241,860	254,422	31,877	29,982	11,508	71,556	72,480	5,300	230,021	236,890	95.10	93.10	4,864	15,340	10,680	3,525	13,180
Kansas City Southern	3 mos.	75,529	3,495	79,024	82,333	11,115	12,067	3,556	18,319	20,506	5,228	69,718	71,184	88.22	86.47	7,326	6,946	6,387	4,293	5,436
Missouri-Kansas-Texas	3 mos.	62,470	3,222	65,692	69,262	12,499	11,466	2,821	16,126	16,868	1,668	63,109	64,199	96.06	92.69	(96)	2,646	(2,981)	(3,086)	2,640
Missouri Pacific	3 mos.	431,192	11,484	442,676	443,113	64,900	66,462	12,077	108,154	96,583	16,898	403,755	391,880	91.20	88.44	27,168	42,844	41,691	27,667	38,030
Norfolk & Western	3 mos.	410,887	15,583	426,470	438,212	61,864	77,098	10,464	87,362	82,783	12,864	351,409	358,340	82.40	81.77	60,466	98,760	38,105	55,968	67,464
St. Louis Southwestern	3 mos.	98,624	1,781	100,405	111,204	14,888	14,369	4,379	27,694	26,308	5,662	97,465	97,990	97.08	88.11	4,401	15,043	1,288	2,720	9,980
Seaboard System	3 mos.	659,470	18,870	678,340	707,629	86,837	86,340	19,172	174,074	166,128	19,247	595,630	590,304	87.80	83.41	98,938	116,346	56,141	60,695	75,098
Soo Line	3 mos.	116,574	2,817	119,391	83,535	20,987	13,649	4,543	28,497	19,384	2,981	112,961	76,076	94.61	91.07	2,696	8,069	5,987	1,771	4,900
Southern	3 mos.	422,063	11,054	433,117	442,735	62,083	61,798	18,195	94,022	90,300	19,110	361,240	360,231	83.40	81.36	74,169	80,601	42,176	43,108	46,552
Southern Pacific	3 mos.	504,077	16,553	520,630	547,429	77,234	62,044	22,903	153,108	163,076	20,338	547,875	549,705	105.23	100.41	(38,220)	15,748	(25,201)	(26,411)	38,914
Union Pacific	3 mos.	480,901	5,876	486,777	502,433	72,233	74,236	17,004	104,832	114,286	22,939	436,185	456,360	89.60	90.83	56,845	41,980	29,970	35,965	36,735
Western Pacific	3 mos.	32,580	475	33,055	39,204	6,053	7,256	989	7,666	8,851	1,597	37,992	43,643	114.93	111.32	(3,438)	(7,109)	(1,885)	(408)	(3,508)

Source: Interstate Commerce Commission

Lines on Labor

A shrunken UTU tries to close a dollar gap

Just about every family knows it, once in a while—the financial pinch when there are more bills demanding cash outgo than there is cash inflow. Families know it. So do the larger "families" known as brotherhoods. And if you were to ask the average railroader which unions, which brotherhoods, are the best-off, chances are that your average railroader—thinking that the biggest must be the richest—would say, "Why, the Brotherhood of Railway and Airline Clerks or the United Transportation Union, certainly."

GUS WELTY

Forget it. Or forget UTU, at least in a current income-vs.-outgo sense.

UTU has problems, big as it is, as the union representing (pretty much) every on-train employee except the locomotive engineer. UTU's immediate solution to those problems was a proposal calling for a special assessment of $5 a month on each member. The membership said no.

Five bucks a month. That's not much, maybe a ticket to a movie or a couple of six-packs. But it wasn't one of the tiny rail unions that was asking for this. This was the United Transportation Union. And yes, train-and-engine-service employees have been averaging something close to $40,000 a year in average annual earnings, so five bucks a month is not that big a bite. But the UTU, asking for votes to approve a special assessment?

The suggestion has been made (*RA*, May, p. 20) that the dozen-plus rail unions would be better off as one union, financially and in terms of bargaining strength. And, in fact, UTU has made a formal and public proposal regarding amalgamation with the Brotherhood of Locomotive Engineers.

But UTU's dues-increase proposal sets things off rather starkly. And if UTU is in a cash-flow bind, what about all the others, most of them smaller organizations?

To be fair about it (and you have to be), UTU faces a somewhat unusual situation, a court decision in a discrimination suit dating back to 1967 that will cost the union something in excess of $8 million. But, whatever, UTU's General Fund declined by about $9.3 million in February 1985. That hit the union's investment program, depriving it of about $1 million a year in investment bond interest. And in the following month, March, union disbursements exceeded receipts by about $90,000.

That, UTU President Fred A. Hardin wrote to union officers, represents, in total, "a situation which I am sure you will agree we cannot continue to tolerate."

In his pitch for approval of the special assessment, Hardin noted that headquarters has been trying to cut costs: "Although we have not furloughed any employees of the International, we have attrited over 30 positions and I sincerely feel that with our continued austerity, the $5 assessment for 12 months will enable us to again become financially sound so that we will have available funds to fight the terrific battles that we are facing in wage-rules negotiations and anti-union programs of the bus companies and railroads."

Perhaps. However, the most pertinent observation came a bit earlier in Fred Hardin's letter to the troops. During the past two years, he wrote, "we have suffered a loss of over 30,000 full dues-paying members."

Hardin says that UTU is facing "a financial crunch."

Maybe so, probably so.

But thriving institutions, even faced with an $8-million expense, usually manage to manage.

Something is wrong, somewhere.

What's wrong is that the rail unions have never seemed able to realize what the railroads have realized—which is that to prosper or even to survive in today's transportation marketplace, you have to be either a giant or a midget, a cross-country trunk line or a shortline.

In his letter to union officers, UTU's Fred Hardin also cited "a continuing rise in the cost of operations...."

Well, welcome to the world of running a business—which a union is. Welcome to the world where you don't exist for long if the cash flow ain't right and the bottom line ain't black. Welcome to the world of win-a-few, lose-a-few, and hope to do better than break-even in the end. Maybe most of all, welcome to the real world, in which unions—after all this time—have to bend, and something called reality sets in.

There's one good thing about it. In that real world, there is, in fact, room for all the players, from both sides.

Given the rail merger movement, though, you have to wonder how many players there can be on the union side.

Class 1 railroad employment

Employee Group	No. of employees, mid-month count April 1985	Percent of change April 1985 from April 1984		Percent of change April 1985 from March 1985	
Total—all employees	307,898	d	4.54	d	1.69
Executives, officials and staff assistants	13,795	d	1.09		.25
Professional and administrative	57,657	d	7.46	d	.05
Maintenance of way and structures	63,010		3.36		11.89
Maintenance of equipment and stores	58,035	d	7.91	d	.23
Transportation (other than train and engine)	20,478	d	11.34	d	.27
Transportation (train and engine)	94,923	d	4.31	d	1.61

Source: ICC

Update

Earnings down 30% on 4.6% traffic decline

A 4.6% drop in first-quarter ton-miles translated into a $400 million decline in operating revenues, from $7.4 billion in the 1984 period to $7.0 billion this year. Meanwhile, operating expenses were down only around $200 million, from slightly less than $6.6 billion to nearly $6.4 million. As a result, ordinary income dropped 30%, from 1984's $600 million to $418 million for the 1985 quarter.

Dr. Harvey A. Levine, vice president of economics and finance for the Association of American Railroads, announced the first-quarter results.

"The economy as a whole was fairly slow for the first quarter of 1985," said Dr. Levine. "In addition, the high first-quarter figure for 1984 can be attributed to the fact that, at that time, the economy was emerging from a recessionary period. Typically, increases in income due to cost-cutting measures taken during such a downturn accompany such an emergence."

Class I Railroads in the United States For the First Quarter

	1985 (millions)	1984 (millions)
Operating Revenues	$7,002.0	$7,411.7
Operating Expenses	6,380.9	6,568.2
Net Revenue from Operations		
United States	621.0	843.6
Eastern District	143.6	202.1
Southern District	175.0	226.1
Western District	302.4	415.4
Rate of Return on Net Investment (12 months ended March 31)	5.4%	5.0%
Ordinary Income		
United States	417.7	600.1
Eastern District	124.5	177.1
Southern District	114.1	142.2
Western District	179.0	280.8
Net Railway Operating Income	390.3	574.6

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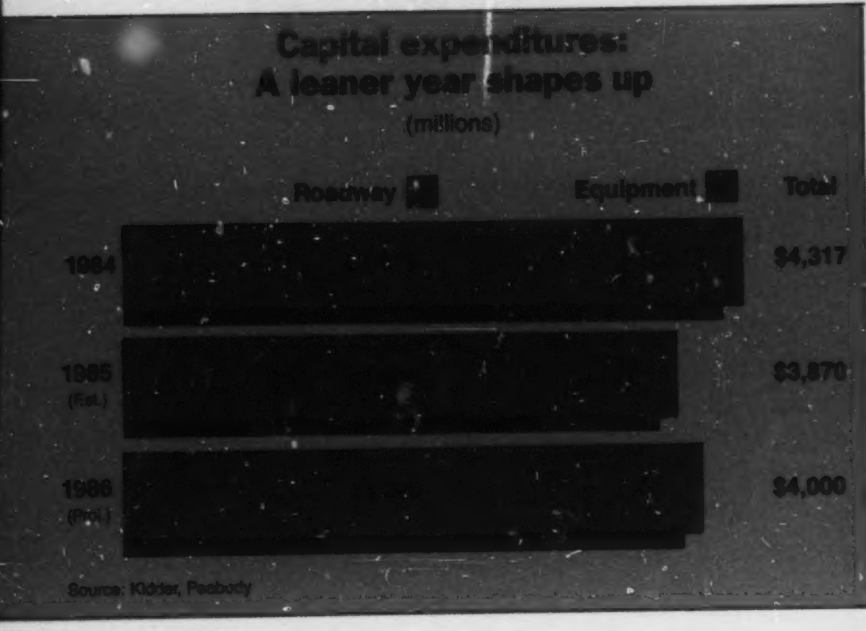
State-of-the-industry



Source: Kidder, Peabody

Coal traffic is predictably down from a year ago, when

Mixed signals at midyear

Traffic and earnings have fallen below last year's levels—but the railroads have made important strides in other areas of great significance to their long-term prosperity.

By LUTHER S. MILLER, Editor

The heat wave that seared the Southeast recently may have brought misery to many, but coal traffic people were not among them. It takes a heap of coal to generate the power to run air conditioners, and in these tepid traffic times a long hot summer is on the wish list of more than one railroad.

Marketing officers are anxiously scanning not only the weather forecasts but the whole economic horizon as they look for signs of an upturn. So far they have found precious few.

For the nation's economy as a whole, the indicators at midyear are good. The Gross National Product rose 3.1% in the second quarter. A 5% increase for the year is now considered likely by many forecasters.

"Unfortunately, we don't haul the GNP," mourns one Santa Fe officer. "Hamburger stands, car washes and microchips don't produce a whole lot of carloads."

The fact is, the limited economic growth that is being experienced is coming in the service and high-tech industries. The factories and farms that produce carload traffic are hurting, and so are the railroads. Loadings are down more than 5% from 1984 levels; revenue ton-miles have dropped nearly 4%.

- **The domino effect.** This means lower earnings, and that in turn means that railroads are taking a second look at capital investment programs that they budgeted when modest traffic increases were forecast. For the first quarter, Class I roads earned $418 million, down 30% from the 1984 quarter. When second quarter figures are added up, they are not likely to be any better, warns Dr. Harvey A. Levine, vice president of economics and finance for the Association of American Railroads. He points out that this year's second quarter will be compared with a period a year ago when coal was being stockpiled for a miners' strike that never materialized.

How does the second half of '85 shape up? The picture is murky. As an example of the difficulties forecasters are facing, Richard E. Briggs, executive vice president of the AAR, cites the report of one analyst who assumed that "a continuation of the trends of the last four months was a 50% possibility, a modest increase above that could be rated a 30% possibility, and a further decline could be a 20% possibility."

A less complicated though still iffy forecast has been put together by rail analysts at Kidder, Peabody and Co. At the June 20 meeting of the American Railway Car Institute's forecasting committee in Chicago, Kidder, Peabody sized up the situation this way: 1985 may see a 5% drop in ton-miles, a 4% decline in operating revenues, and a 17% drop in operating income. The company's analysts see railroad capital expenditures dropping to $3.87 billion from the record $4.3 billion spent last year.

Kidder, Peabody is looking for a modest railroad recovery in 1986, with ton-miles rising 2-3%, revenues up 5%, and operating profits increasing 8-10%. This could mean a return to the $4 billion level for capital investment.

For freight-car builders, the news continues to be grim. At its recent Chicago meeting, the ARCI collected the market forecasts of eight carbuilders and nine component suppliers. For 1985, they expect deliveries of new cars to be in the 12,000-13,000 range, rising to 14,000-16,000 in 1986. The low side of those forecasts represents less than one sixth of production capacity.

- **On the plus side.** As the AAR's Briggs points out, all of the signs at midyear '85 are not bad—far from it. In one area of great long-range significance—deregulation—the railroads made important strides in this year's first half.

stockpiling was under way. Sluggish grain traffic has been the big disappointment of the year so far.

John S. Murray

Late in 1984, the prospect of some degree of reregulation was a darkening threat. A large number of shippers were concerned over the Interstate Commerce Commission's interpretation of the Staggers Rail Act of 1980—particularly with respect to the closing of gateways, the cancellation of through rates, and the resulting lessening of inter-railroad competition. But in recent months a team of railroad negotiators headed by AAR President William H. Dempsey has dealt effectively with most of the dissidents. Early in the year, the AAR reached an accord with the National Industrial Transportation League (and subsequently with the Chemical Manufacturers Association) on competitive-access issues. An agreement with the American Paper Institute helped mute the outcry over market dominance issues. Meanwhile, a group of key shippers—those who had never had any real quarrel with Staggers in the first place—banded together under the banner of CARS (Committee Against Revising Staggers) to support the railroads in Congress.

The biggest remaining threat to Staggers is now represented by a coalition of utility and coal interests that calls itself Consumers United for Railway Equity. This coalition, which is controlled by the utilities, wants such drastic changes in the Staggers Act that the two sides up until early summer had not even been able to agree to talk. There were indications in mid-June that they might at least have reached the talking stage, though railroad people were not hopeful that any agreement could be achieved that would approach in substance those reached with other shippers.

There was one big piece of news out of Washington—the President's tax reform proposal—that railroads were slow to evaluate. They finally did take a position June 27 opposing parts of the program that they said would add up to a "double whammy." The first of these, loss of the investment tax credit, would not in itself be so bad if lower taxes would follow. But a second provision, under which the government would recapture taxes on 40% of credits taken over a five-year period, would cost the industry around $2 billion. Railroads also expressed concern over the effects of these changes on their customers.

Another development that was definitely upbeat was the settlement, announced late in June, of the railroads' dispute with the United Transportation Union. National Railway Labor Conference Chairman Charles I. Hopkins called the settlement a "win-win situation," with both labor and management benefiting at a time when the transportation marketplace has become "savagely competitive."

• **Looking for growth.** If the railroads have reason to look back on the first half of the year as one of long-term accomplishment for the industry, the fact remains that it's short term performance that pays the bills. And the traffic patterns that have emerged so far this year reinforce the feeling of many marketing people that as the economy continues to tilt toward service and high-tech, and away from smokestack, the railroads are going to have to look to the other modes for growth traffic.

One troublesome aspect of this year's traffic picture is intermodal business. In recent years it has grown in bad times and good times, but this year it has declined at about the same rate as carload traffic. One reason is, of course, reduced factory output—but during the great economic recession of a few years ago TOFC/COFC traffic actually grew. Why the turnaround this year? Price-cutting by a growing, hungry fleet of small truckers is one reason. Another, suggests Trailer Train President Raymond Burton, is boxcar competition.

In the carload traffic picture, the only really bright spot is occupied by motor vehicles and related equipment. That is high-rated traffic, and the railroads hauled 472,115 carloads of it in this year's first 22 weeks—up 5.7% over the 1984 period and 32.9% above 1983 levels.

Elsewhere, there are considerably more minuses than pluses. Coal produced 2,411,193 revenue carloads up to June 1, a 3.6% drop from 1984 levels, and that was not unexpected in view of last year's stockpiling. Far more disappointing was grain: the 476,958 carloads hauled in this year's first 22 weeks were down 20.8% from 1984.

Farm products except grain (81,355 carloads) was down 12.7%; metallic ores (305,478), down 12.5%; non-metallic minerals (236,633), down 7.1%; primary forest products (265,775), down 13.2%; lumber and wood products except furniture (155,934), down 5.1%; pulp, paper and allied products (315,188), down 3.3%; chemicals and allied products (553,637), down 1.4%; petroleum products (99,386), down 6.4%; stone, clay and glass products (226,848), down 3.5%; coke (109,827), down 4.9%; waste and scrap materials (194,571), down 12.5%; forwarder and shipper association traffic (141,646), down 15.7%; all other carloads (1,236,086), down 1.8%.

The only categories showing increases, except automotive, were crushed stone, gravel and sand (237,367), up 8.2%; and food and kindred products (240,460), up 1.1%. ■

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Pittsburgh opens a downtown subway

August 1985

RAILWAY AGE

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Rail lubrication:

What will the tests prove?

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August 1985

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Soo's acquisition of Milwaukee caught many people (including some at Soo) by surprise. But S/M is moving fast to shore up its position.

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CN has developed an articulated covered hopper for service in a part of Canada where the roadbed is too unstable for standard grain cars.

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By pooling cars according to manufacturer, not plant, railroads have substantially reduced empty car miles. A single autorack pool could come next.

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Tests suggest that by lubricating tangent as well as curved rail, the industry can save half a billion a year through reduced train resistance.

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71 Pittsburgh's PAT hits paydirt

It took nearly 80 years to bring Pittsburgh's downtown transit subway from dream to reality, but the wait appears to have been worthwhile.

Pueblo tests were first to suggest the great savings possible from lubricating tangent rail. (Transportation Test Center photo.)

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While VIA Rail is losing some federal aid, a bottom-line oriented management is optimistic as the railroad gains greater control over its costs.

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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014

USPS 449-130, Vol. 186, No. 8

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years; all other countries $35 one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies $3 plus postage and handling, except special issues. Copyrighted 1985.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT. 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

Market Outlook

Equipment

Canadian Wheat Board: An order for 620 hopper cars is now being delivered by Marine Industries' Railcar Division at the rate of six cars per working day. Total cost of the order is estimated at $38.6 million (Canadian).

Detroit Edison: Placed a $25-million order with Greenville Steel Car for 610 aluminum/steel gondola cars for delivery late this year. The cars, each of which will carry a payload of 108 tons, will haul low-sulfur coal from the Decker mines in Montana to Superior, Wis. The coal will then move by ship to a facility in St. Clair County, Mich., that serves Detroit Edison's St. Clair and Belle River plants. DE says savings from the new lightweight cars—estimated at more than $2.5 million a year—will be passed on to customers. Completion of the order, which amounts to five trainsets plus spares, will make DE the first utility to be served by an all-aluminum-bodied fleet out of the Powder River Basin.

Trailer Train: Ordered 250 single-axle, trailer-only Front Runner flat cars from Bethlehem Steel for third-quarter delivery; ordered 175 five-well, double-stack container cars from Gunderson for third-quarter delivery; and acquired 95 five-well, double-stack container cars from Thrall—all at a total cost of $48.4 million.

Facilities

Korean National Railroad: A $67-million World Bank loan will help KNR finance a modernization project in the Seoul-Busan corridor. The program calls for the resignaling of about 180 miles of double-track line; installation of ctc to increase capacity to 170 trains a day; and acquisition of new rolling stock.

Seaboard System: Opened a new, $11.3-million intermodal terminal at Orlando, Fla. that is expected to handle more than 100,000 trailers a year. Occupying more than 90 acres, the new facility is the southern terminus of Seaboard's all-produce Orange Blossom Special.

Revenue freight carloadings

Commodity	July 13 week	July 6 week	June 29 week	June 22 week
Grain	25,044	22,829	25,157	26,609
Other farm products	3,460	3,032	3,601	3,735
Metallic ores	13,503	12,641	19,469	18,548
Coal	86,261	80,121	117,406	122,493
Crushed stone, gravel and sand	13,038	10,594	13,112	13,605
Nonmetallic minerals	11,101	9,968	11,290	10,474
Grain mill products	9,526	8,461	9,633	9,872
Food and kindred products	10,549	8,298	11,171	10,986
Primary forest products	11,280	8,361	11,980	12,005
Lumber and wood products except furniture	6,520	6,788	8,546	7,730
Pulp, paper and allied products	12,968	12,267	14,668	13,913
Chemicals and allied products	22,274	18,943	25,228	22,408
Petroleum products	4,705	4,079	4,796	4,679
Stone, clay and glass products	10,604	9,033	11,373	11,036
Coke	5,191	4,698	4,917	5,147
Metals and products	8,559	8,092	9,581	9,151
Motor vehicles and equipment	16,222	13,535	20,176	22,686
Waste and scrap materials	7,828	5,714	8,154	8,336
Forwarder and shipper assn. traffic	5,956	5,319	6,650	6,330
All other carloads	54,103	49,755	60,991	59,605
LCL traffic	109	139	165	207
Total Cars Loaded	**338,801**	**300,566**	**398,064**	**399,495**
% change from previous year	(12.2)	(7.2)	(0.8)	(2.6)
Estimated revenue ton-miles (billions)	15.9	14.2	18.6	18.5
% change from previous year	(9.0)	(5.3)	0.4	(0.5)

Cumulative Total:	1985	1984	% change
28 weeks	480.2	498.7	(3.7)

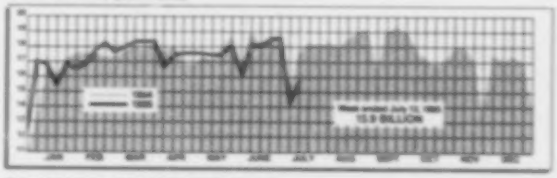
Piggyback loadings

	July 6 week	June 29 week	June 22 week	June 15 week
Trailers/containers	71,485	91,167	86,320	89,150

Cumulative total, 27 weeks		% change from 1984
Trailers/containers	2,277,059	(3.2)

Rail freight traffic trends

Billion ton miles (Estimated)



Source: Association of American Railroads

Freight cars

	DELIVERED			ORDERED			ON ORDER AND UNDELIVERED		
	June	6 months		June	6 months		July 1,	Average Backlog	
	1985	1985	1984	1985	1985	1984	1985	1985	1984
Built new by carbuilders	1,077	5,537	5,080	827	4,842	10,189	3,843	4,139	6,434
Built new in RR shops	0	406	0	0	0	250	0	47	42
Built new—total	**1,077**	**5,943**	**5,080**	**827**	**4,842**	**10,439**	**3,843**	**4,186**	**6,476**
Rebuilt	0	0	0	0	0	0	0	0	0
TOTAL	**1,077**	**5,943**	**5,080**	**827**	**4,842**	**10,439**	**3,843**	**4,186**	**6,476**
Locomotives (new and rebuilt)	28	212*	191	N/A	N/A	N/A	267	263	157

Source: Transportation Div., AAR and American Railway Car Institute

*revised figure

Watching Washington

Red herrings and hypocrisy

In the dog days of summer, 1985, the temperature is not the only thing that has been heating up in Washington. The ongoing debate between the Association of American Railroads and Consumers United for Rail Equity is causing blood to boil on both sides.

Understandably frustrated by the paper blitz being generated by C.U.R.E., AAR President William H. Dempsey stated on July 22 that his group wants to "inject a note of reality" into the discussion on the pros and cons of the Staggers Act, but that a rational dialogue will be hard to achieve if the anti-Staggers groups continue to indulge in "flawed methodology," red herrings, hypocrisy, and double standards.

To date, C.U.R.E.'s main charges are that: 1) the railroads have monopoly power over coal transportation; 2) coal rates are unreasonably high; 3) the railroads use high coal rates to subsidize other traffic; and 4) since the railroads' rate of return is now averaging 6%, instead of the pre-Staggers 2% or 3%, the cost of capital is not a proper yardstick of a railroad's revenue adequacy.

The railroad industry has been addressing these issues and others since 1980. In this latest round in the war of words, the AAR has released a 36-page study of the electric utility industry.

Dempsey is particularly bothered by the notion being advanced by C.U.R.E. that rail coal rates are pushing up electric rates. The study shows that "railroad rates represent a tiny fraction of total electric utility costs. The delivered price of coal—including the rail component—to utilities increased 8% between 1981 and 1984. Electric rates increased 19%. Even if the entire 8% increase in the cost of coal had been attributable to rail rates—which it was not—the increase per kilowatt-hour would have been less than .03 cent." And yet the price per kilowatt-hour increased by 1.06 cents, or 35 times as much. As Dempsey points out, "the average electric consumer would probably have been thrilled to have had rail rate increases passed along—if those had been the *only* increases, and they were not."

The AAR analysis compares trends in the rates of return on equity from 1979 to 1983 for the electric utilities, the railroads, and all industry generally (see below). The pattern is one of steadily rising profitability for the utilities compared with a gradual fall for all industry, with the railroads faring "much worse" than the other two categories.

As another indication that the utilities have not suffered unduly under Staggers, the report shows that the dividends paid out to utility investors have increased 78% since 1979, while the annual additions to retained earnings have increased more than 100%. Today, many utilities are undertaking enormous diversification programs (while criticizing some railroads for doing likewise), and at the same time are filing for more rate increases. The AAR points out that "of the $24.4 billion in increased rates paid by utility customers between 1981 and 1984, $7 billion—or 29%—went to utility investors."

The report continues: "...while utilities condemn using a single return equal to the cost of capital as the standard for the railroad industry, and urge instead the use of other financial ratios which could permit the Commission to regard returns below the cost of capital as adequate, they insist upon nothing less than the cost of capital for themselves. Indeed, anything less becomes an automatic justification for an increase in electricity rates."

—Judy McCusker

RETURN ON EQUITY

	1979	1980	1981	1982	1983
Electric utilities	11.2	11.4	12.6	13.6	14.4
Railroads	5.3	6.0	9.6	5.4	7.3
All industry	16.5	14.7	13.6	10.2	11.2

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Lines on Labor

Two accidents that didn't have to happen

Shortly before 4 a.m. on April 13, 1984, two Burlington Northern freight trains collided head-on at Wiggins, Col. Little more than a week later, shortly before 5 a.m. on April 22, 1984, a Burlington Northern freight train struck the rear of another BN train near Newcastle, Wyo. The combined toll: seven crew members killed, four crew members injured, property damages adding up to more than $5.2 million.

GUS WELTY

Now, the National Transportation Safety Board has issued its report on these two accidents. It is a story of alcohol and/or drug use...of head-end crew members asleep and/or impaired...of supervision spread thin...of railroad personnel unable to define a key phrase in Rule G...of crew members unsure of their responsibilities or unwilling to accept them. It is a story of circumstance piling upon circumstance to make disaster inevitable. Still, it is a story of two accidents that did not have to happen, of seven lives that did not have to be lost...if, if, if.

NTSB summed up its findings starkly: Probable cause of the Wiggins accidents "was the engineer and other head-end crew members of Extra 6714 West falling asleep and failing to comply with restrictive signal aspects. Contributing to the failure of the engineer and fireman was their consumption of alcohol and fatigue resulting from their voluntary lack of sleep during their off-duty time, aggravated by irregular work/rest cycles...Probable cause of the Newcastle accident was the failure of the engineer and head brakeman of Extra 7843 East to operate their train in compliance with restrictive signal aspects because they were asleep or, in the case of the engineer, otherwise impaired. Contributing to the failure was the use of marijuana by the engineer, as well as the fatigue of the engineer and head brakeman due to their voluntary lack of sleep and unpredictable working hours. Contributing to both accidents were the conductors' failure in both instances to protect their trains in compliance with Operating Rules 34 and 804(B), and Burlington Northern's failure to supervise properly its train operations."

There are so many places where you could attempt to start, in trying to analyze what went wrong. NTSB itself came up with 35 conclusions, followed by a series of recommendations to BN, to the AAR and to the FRA. Frankly, there isn't much that's all that new in any of the recommendations. And, NTSB can only recommend. It cannot mandate, it cannot order anybody to do anything.

But, a few observations may be in order, in view of what NTSB said in these cases and in another report that came out after the BN report.

One is that, after all these years, there is simply no reason why employees and even supervisors have no clear understanding as to what "subject to duty" means in the context of Rule G.

Another is that, after all these years, there is simply no reason why train crew members should have ambiguous thoughts about what they should do, what they are required to do, if it becomes obvious that the person at the throttle is not operating the train as it should be operated.

A third, having nothing really to do with rule interpretations, is that—whatever FRA comes up with as an alcohol/drug rule—nothing is going to work unless supervision is tightened. For instance, BN's current philosophy, or culture, having to do with pushing decision-making down in the organization, is good in theory—but decisions, and the whole supervisory process, can be pushed down too far. NTSB quotes a senior officer of BN as saying that one of its objectives was to rely more heavily upon engineers and conductors "for the management of its train operations rather than increase its supervisory force....We pay our engineers and conductors...a differential over the other crafts to take charge and take responsibility for the train. I think it's a waste of stockholders' money to have to over-manage if we've got the resources and the ability for our employees to do their job of managing their operations."

Obviously, at Wiggins and at Newcastle, the philosophy, the culture, the theory, did not work. Individuals were not responsible, and supervision was not there to make sure that they were.

So, where's the answer? In rules? Maybe, but probably not. Years ago, *Railway Age* did a story on grade-crossing accidents. Rail unions furnished some of the photos that were used. Many photos could not be used because they were just too terrible. Maybe "safety" meetings should start portraying this side of the story.

Class 1 railroad employment

Employee Group	No. of employees, mid-month count May 1985	Percent of change May 1985 from May 1984	Percent of change May 1985 from April 1985
Total—all employees	310,135	d 3.84	.73
Executives, officials and staff assistants	13,800	d 1.05	.04
Professional and administrative	57,411	d 7.86	d .43
Maintenance of way and structures	67,282	10.37	6.78
Maintenance of equipment and stores	57,495	d 8.77	d .93
Transportation (other than train and engine)	20,189	d 12.59	d 1.41
Transportation (train and engine)	93,958	d 5.28	d 1.02

Source: ICC

NOTE

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Cov. 1, p. 5-6, 14, 19-20.

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Transit cars get new life at Hornell

September 1985

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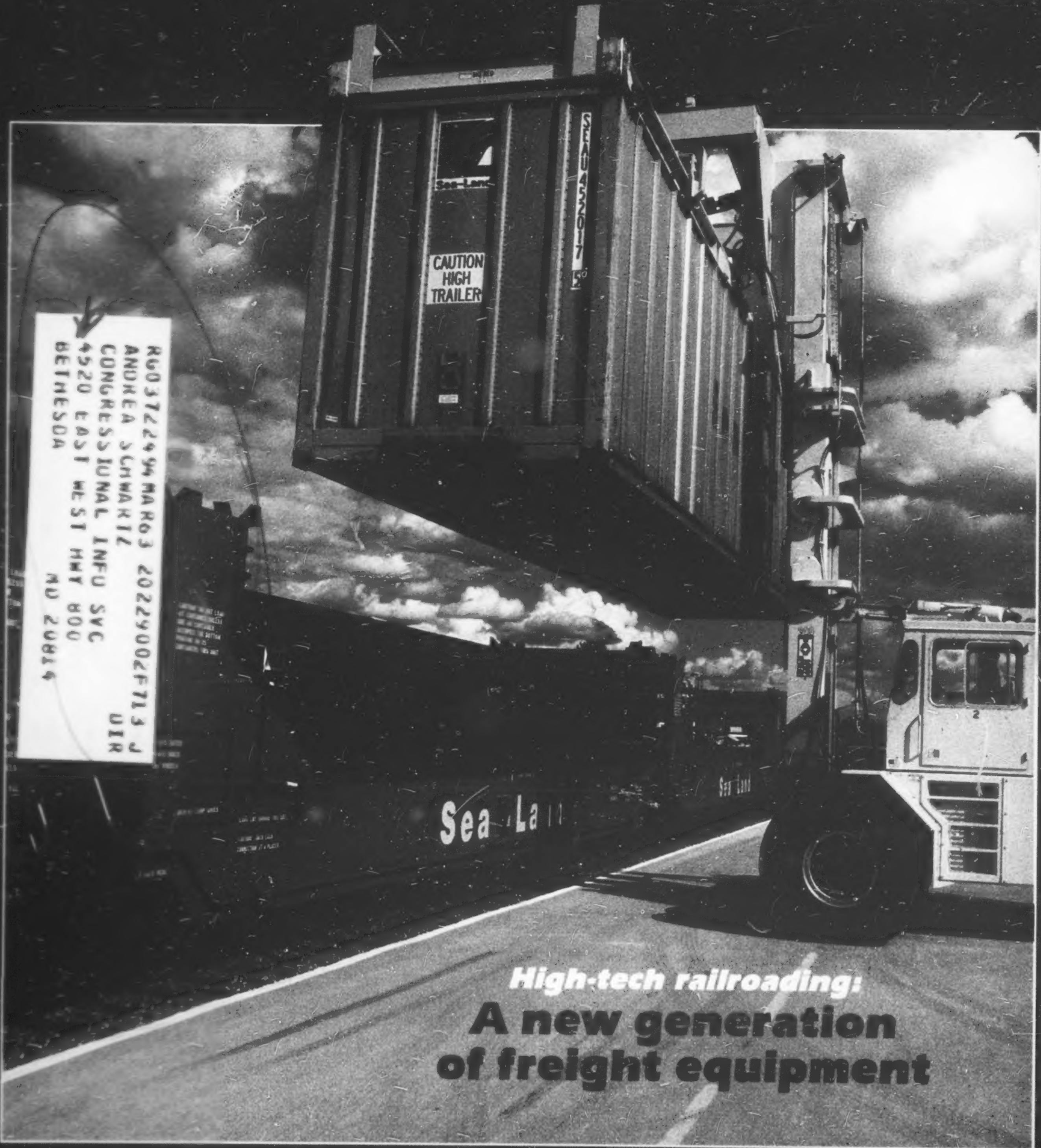
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High-tech railroading:

A new generation of freight equipment

RAILWAY AGE
...for the new age of railways
September 1985

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Double-stack container cars and aluminum/steel coal cars prove the validity of the axiom that there's nothing like an idea whose time has come.

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The race to bury cable alongside railroad rights-of-way continues, despite worrisome signs that one day there may be more capacity than customers.

58 Clearing goes automatic

Owners of Chicago's Clearing Yard have decided to invest $4.3 million to automate the east and west humps and speed up an already fast operation.

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In an exclusive interview with *Railway Age*, FRA Administrator John H. Riley describes the thinking behind the new rule—and what it's going to take to make it work.

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Transit cars get new life at Hornell
A new generation of freight equipment

Gunderson/Greenbrier Twin-Stack loading at Tacoma was photographed by Bruce Harmon.

80 Hornell: Back in business

A steady stream of weary transit and commuter equipment is pouring into the former Erie locomotive shop to be rejuvenated by Morrison-Knudsen.

87 Chicago's test-tube line

As it speeds riders to O'Hare, CTA's airport extension is serving as a testing ground for new system-wide signaling and maintenance practices.

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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014

USPS 449-130. Vol. 186, No. 9

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years; all other countries $35 one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies $3 plus postage and handling, except special issues. Copyrighted © 1985.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Second Class postage paid at Bristol, CT 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

Inside

Integral trains: A beginning

LUTHER S. MILLER

The block of copy that appears on pp. 44-45 of this issue may well turn out to be the most important we have published in many years. In these pages, as part of his cover story on a new generation of freight equipment, real and imagined, Senior Editor Gus Welty describes nine concepts that the AAR has received in response to its request for High Productivity Integral Train proposals. If any of them comes close to achieving the AAR's HPIT goals—cost reductions of as much as 50% in intermodal integral train operations, as much as 35% in bulk-commodity operations—this will turn out to have been a very big story, indeed.

What the project has so far produced are concepts weighted heavily toward intermodal, but with two proposals—from Ortner and Pullman Standard Manufacturing, Trinity—dealing with development of integral trains for coal and other bulk commodities. Intermodal proposals have come from ACF Industries, Brookville Locomotive, Budd, Locomotion, New York Air Brake, Railmaster Systems, and UTDC, and Ortner is also planning to come in with an intermodal proposal. Most of the concepts involve use of existing technology, but more imaginatively than it is now being used.

Would a 5% return turn on a utility?

The regs-to-riches story of the post-Staggers railroads is one that some people never tire of telling—especially those people in the utility business who want to get the regulation clock ticking again. It's true that the ICC has determined, under Staggers Act guidelines, that railroads are "entitled" to a rate of return of around 15%. But they are still far, far away from earning that return. For the 12 months ended last March 31, the freight railroads as a group earned 5.19%. Here's how individual roads performed:

Southern District:

Florida East Coast	5.04%
Illinois Central Gulf	2.77%
Seaboard System	5.51%
Southern	6.39%

Western District:

Santa Fe	3.82%
Burlington Northern	8.59%
Chicago & North Western	4.46%
Denver & Rio Grande Western	4.16%
Kansas City Southern	7.49%
Missouri-Kansas-Texas	3.05%
Missouri Pacific	5.02%
St. Louis Southwestern	2.35%
Soo Line	2.97%
Southern Pacific	0.96%
Union Pacific	4.36%
Western Pacific	0%

Eastern District:

Baltimore & Ohio	3.57%
Chesapeake & Ohio	4.81%
Conrail	7.59%
Elgin, Joliet & Eastern	0%
Grand Trunk Western	2.61%
Norfolk & Western	5.98%

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Change of address should reach us six weeks in advance of next issue date. Send both old and new addresses with address label to Subscription Department, Railway Age, P.O. Box 530, Bristol, CT 06010 or call (203) 582-9546. Post Office will not forward copies unless you provide extra postage.

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ISSN 0033-8826/85 $2.00 + 0.00

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Market Outlook

Facilities

New York DOT: Awarded a $62 million contract to the joint venture of Morrison-Knudsen and Mergentime Corp. for construction of a 9,100-foot marine railroad trestle linking the Highbridge and Harlem River rail yards in New York City.

Equipment

Amtrak: Directors approved expenditure of $5 million for 50 new mail/express cars scheduled to go into service late in 1986. An outside contractor, still to be selected, will supply car shells that will be sent to Amtrak's Beech Grove, Ind., shops to be fitted with passenger car trucks, 480-volt power train lines, communication lines and interior lighting. Amtrak will use 21 of the new cars to replace existing baggage cars that would otherwise cost $2.8 million to overhaul. Five cars will be used to eliminate an existing baggage car shortage. The 24 remaining cars will go into service on six routes where current mail, baggage and express demand exceeds capacity.

Chicago & North Western: Ordered 35 new 3,600-hp SD50 diesel-electric units from the Electro-Motive Division of General Motors at a cost of $45.5 million.

Conrail: Ordered 30 new SD50 diesel-electric units from the Electro-Motive Division of General Motors at a cost of $38.6 million.

Washington Metropolitan Area Transit Authority: Awarded a contract to Breda Construzioni Ferroviarie for an additional 72 rapid transit cars. When this order is delivered, Breda will have supplied WMATA with 366 cars valued at more than $400 million.

- WMATA awarded a $6.4 million contract to Knorr Brake Corp. for the supply of 260 carsets of truck mounted hydraulic disc brake equipment.

XTRA, Inc.: Placed a $2.5-million order with Miller Trailers for 200 trailers measuring 45 feet by 102 inches. The units will be leased to Illinois Central Gulf. XTRA awarded Miller a separate contract for 100 48-foot intermodal trailers, 80 new units and 20 rebuilds.

Revenue freight carloadings

Commodity	Aug. 10 week	Aug. 3 week	July 27 week	July 20 week
Grain	20,582	20,782	20,770	21,405
Other farm products	2,859	2,818	3,001	2,971
Metallic ores	13,890	13,028	14,089	14,123
Coal	120,995	121,916	119,918	107,267
Crushed stone, gravel and sand	13,187	13,052	13,153	13,450
Nonmetallic minerals	11,133	9,523	12,577	12,681
Grain mill products	10,047	10,207	9,933	9,644
Food and kindred products	10,847	11,335	10,772	11,116
Primary forest products	10,174	10,838	10,986	10,927
Lumber and wood products except furniture	6,794	7,586	7,178	7,152
Pulp, paper and allied products	13,020	13,729	13,148	12,911
Chemicals and allied products	22,352	23,072	22,056	21,671
Petroleum products	4,609	4,735	4,729	4,851
Stone, clay and glass products	11,068	10,618	10,425	10,410
Coke	4,785	4,827	4,840	4,357
Metals and products	8,280	9,080	8,957	9,251
Motor vehicles and equipment	17,738	17,568	19,570	19,305
Waste and scrap materials	8,383	8,272	8,006	8,460
Forwarder and shipper assn. traffic	6,863	6,955	6,681	6,541
All other carloads	59,747	60,239	59,647	56,107
LCL traffic	153	162	181	186
Total Cars Loaded	377,366	380,332	380,467	367,786
% change from previous year	(6.3)	(6.3)	(6.5)	(8.4)
Estimated revenue ton-miles (billions)	17.4	17.6	17.5	17.0
% change from previous year	(2.9)	(2.8)	(2.6)	(5.7)

Cumulative Total:	1985	1984	% change
32 weeks	549.6	570.5	(3.7)

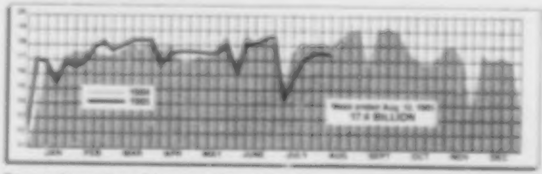
Piggyback loadings

	Aug. 3 week	July 27 week	July 20 week	July 13 week
Trailers/containers	88,333	88,496	86,543	82,590

Cumulative total, 31 weeks		% change from 1984
Trailers/containers	2,623,021	(2.9)

Rail freight traffic trends

Billion ton miles (Estimated)



Source: Association of American Railroads

Freight cars

	DELIVERED			ORDERED			ON ORDER AND UNDELIVERED		
	July	7 months		July	7 months		Aug. 1,	Average Backlog	
	1985	1985	1984	1985	1985	1984	1985	1985	1984
Built new by carbuilders	1,075	6,612	6,315	1,090	5,932	10,796	3,858	4,100	6,454
Built new in RR shops	0	406	0	0	0	250	0	40	71
Built new—total	1,075	7,018	6,315	1,090	5,932	11,046	3,858	4,140	6,525
Rebuilt	0	0	0	0	0	0	0	0	0
TOTAL	1,075	7,018	6,315	1,090	5,932	11,046	3,858	4,140	6,525
Locomotives (new and rebuilt)	38	250	284	N/A	N/A	N/A	274	284	157

Source: Transportation Div., AAR and American Railway Car Institute

Watching Washington

GNP grows faster than ton-miles

Transport Policy Associates, a Washington-based consulting firm that compiles statistics formerly put together by the now-defunct Transportation Association of America, has completed its analysis of the first half of the decade of the '80s. For the freight transportation modes, the news is not good.

While the Gross National Product (total outlays for all goods and services) increased by 39% during the 1980-1984 period, total freight outlays rose by only 29%. As a share of the GNP, the nation's total freight bill declined steadily—from 8.09% in 1980 to 7.96% in 1981, 7.67% in 1982, 7.52% in 1983, 7.49% in 1984. The trend continues in 1985: the GNP is experiencing a modest increase, but intercity ton-miles for all modes during the year's first five months were down.

The following figures are from TPA's mid-year 26-page supplement to the booklet, "Transportation in America." The supplement is free to subscribers; it is available to non-subscribers, for $10, from TPA at 810 18th St., N.W., Suite 508, Washington, D.C. 20006.

The Nation's Freight Bill
(Millions of Dollars)

	1980	1984p
Highway		
Truck - Intercity		
ICC-Authorized	43,000	52,100
Non-ICC-Authorized	51,645	68,565
Truck - Local	60,545	87,678
Bus	235	242
	155,425	208,585
Railroads	27,702	30,128
Water		
International	8,279	10,186
Coastal, Intercoastal	3,155	3,584
Inland Waterways #	2,395r	2,495
Great Lakes	513	456
Lock, Channels	1,156r	1,167
	15,498	17,888
Oil Pipe Line		
Regulated	6,356	7,771e
Non-Regulated	706	863e
	7,062	8,634
Air		
Domestic	2,723	4,212
International	1,211	1,354
	3,934	5,566
Freight Forwarders @	721	506
Other Shipper Costs		
Load/Unload Freight Cars	1,676	1,929
Operation Traffic Depts.	756	991
	2,432	2,920
GRAND TOTAL	212,774r	274,227
GROSS NATIONAL PRODUCT (Billions of Dollars)	2,631.7	3,662.8
GRAND TOTAL % OF GNP	8.09%r	7.49%

r Revised
e Estimated
@ Operating revenues after payments to carriers.
# Figures increased by adding foreign traffic moving on domestic inland waterways.

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Lines on Labor

The UTU vote: When rumor defeated fact

Some might shrug and say it was "democracy in action." Those with a firmer grip on reality might call it "the tyranny of the minority." Students of political machination might regard it simply as a case of rumor overpowering fact. "It," of course, refers to the United Transportation Union's rejection at the end of July of a tentative agreement that was worked out in long, tough bargaining sessions by negotiators representing the UTU and the National Railway Labor Conference. "It," both sides agreed, was a reasonable agreement, one that seemed to attack a number of the problems facing the union and the railroads.

GUS WELTY

But, there was a time-bomb ticking in the UTU's Constitution, and on July 30 it went off. UTU suddenly was not so "united," after all.

But then, it never had been, because its Constitution gives minorities the right to be tyrannical.

Put most simply, that Constitution says that a majority vote of general chairmen representing each craft within the union is required in order for a proposed agreement to be ratified. Within a given craft, majority rules. But ratification demands that every craft deliver that majority.

So when UTU counted the votes, it found its engineers, conductors, brakemen, yardmen, dining car stewards and yardmasters voting for ratification. It found one craft, the firemen, rejecting the pact. And that's all it took, a vote-down by one craft. As UTU President Fred A. Hardin put it, in accordance with the provisions of the Constitution, "the proposed agreement is rejected in its entirety for all crafts."

Tyranny, in this case, had its roots in the bargaining that led to creation of the UTU in 1969, as a combination of the Brotherhood of Railroad Trainmen, the Order of Railway Conductors & Brakemen, the Switchmen's Union of North America and the Brotherhood of Locomotive Firemen & Enginemen. Three of these unions, BRT, ORC&B and SUNA, had a history of rivalry in battling for representation rights; the fourth, BLF&E, had its principal quarrel with the Brotherhood of Locomotive Engineers. But, ORC&B, SUNA and BLF&E did have one thing in common, a fear of being swallowed whole into the belly of the whale, the Trainmen's organization.

Ergo, in order for there to be an amalgamation, BRT had to bend double backwards in the name of craft autonomy. A majority vote on ratification would suffice within each craft, but ratification would not carry without approval by each and every craft.

The result, on July 30, was that a decent agreement was blown up by a craft that probably accounts for about 10%, plus or minus, of UTU's membership.

The next logical question is: Well, if all those other crafts found the proposed agreement acceptable, why did the firemen balk?

The answer may lie in one section of the proposal that provided for negotiation and, if necessary, arbitration of the railroads' proposed elimination of firemen and hostlers. This particular section also had to do with the mechanics of elimination, rights and protection of employees involved, and terms for selection, training and promotion of future engineers.

Apparently, that started the rumor mill a-churning, so much so that Fred Hardin had to respond, and this is what he said:

"There have been rumors spread that firemen will be eliminated by Nov. 1, 1985. There is no basis whatsoever for those rumors. Neither I nor any responsible officer of this union believe that any tribunal would eliminate any fireman...except by normal attrition. In fact the carriers offered that in a proposal that the officers declined in favor of the one contained in the proposed settlement. Many enginemen officers feel that we can negotiate or even arbitrate a far better settlement that will provide protection and the continuation of the craft under the provisions of this agreement...than we could expect from a Presidential Emergency Board or Congress."

Overall, UTU's president seemed to be doing all he could do to obtain ratification. He called the proposed settlement "an excellent agreement...in the best interest of our membership." It would give UTU members, he said, "absolutely the most we could expect in these trying times..." But the bomb went off.

And it all makes for wonderment as to what might have happened back in the '60s if the fears of the small unions had not been so great or, for that matter, if the train-service unions had decided to let the BLF&E fend for itself against attack by both the BLE and the railroads.

Class 1 railroad employment

Employee Group	No. of employees, mid-month count June 1985	Percent of change June 1985 from June 1984	Percent of change June 1985 from May 1985
Total—all employees	309,142	d 7.27	d .35
Executives, officials and staff assistants	13,809	d 1.03	.02
Professional and administrative	57,357	d 7.70	d .06
Maintenance of way and structures	67,160	d 6.86	d .02
Maintenance of equipment and stores	56,291	d 9.99	d 1.78
Transportation (other than train and engine)	20,385	d 7.84	1.15
Transportation (train and engine)	94,140	d 6.34	d .25

Source: ICC

NOTE

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PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 5-6, 14, 20, 23,

76-77.

C8400-1

BART: Building for a bigger tomorrow

October 1985

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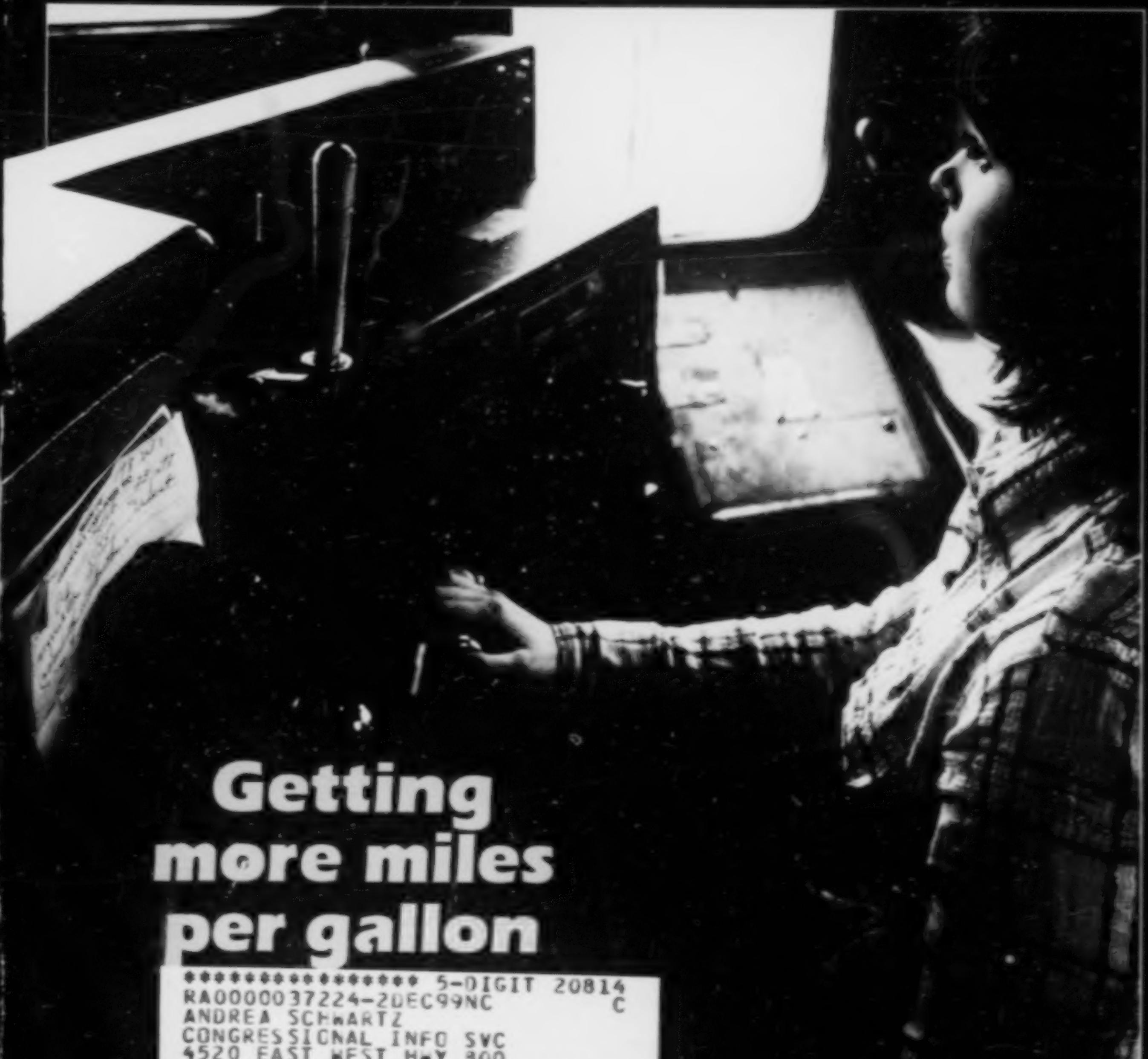
...for the new age of railways



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...for the new age of railways

October 1985

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39 Fuel conservation: The fight goes on

Diesel fuel prices are down from the dollar-a-gallon peak of a few years ago, and the supply is ample. But there's no let-up in conservation efforts.

44 Southern: A signal achievement

The railroad has been rapidly replacing pole lines with electronic coded circuits. The result has been substantial cost savings and fewer signal failures.

53 The microprocessor comes to the interlocking

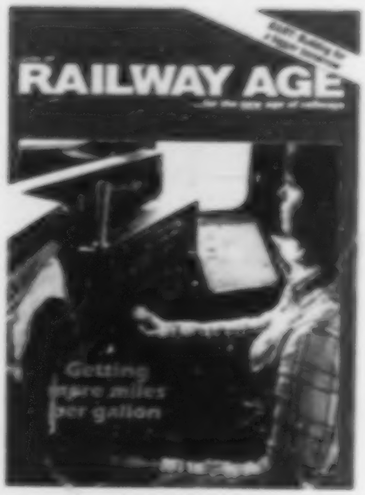
The first installations have been made of microprocessor-based vital interlockings that replace costlier and harder-to-maintain vital relay-based systems.

56 Advice to short lines: Don't short-change m/w

Good track doesn't come cheaply and it's no job for amateurs, say experienced operators. Here, some experts offer both general and specific advice.

74 How BART is coping with growth

A $520-million track and equipment program will increase capacity by 27%, but that won't be enough. BART figures its present mileage may need to be doubled.



Cover photo: Santa Fe Railway engineer L.C. Will, photographed by Orville Brent, Jr., chief photographer, Santa Fe Southern Pacific Corp.

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Published monthly by the Simmons-Boardman Publishing Corporation, 345 Hudson St., New York, N.Y. 10014

USPS 449-130, Vol. 186, No. 10

Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $12 one year, $22 two years; all other countries $35 one year. All other subscriptions in the U.S., Canada and Mexico: $30 one year; all other countries: $50 one year. All subscriptions payable in advance. Single copies $3 plus postage and handling, except special issues. Copyrighted © 1985.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA 18301. Second Class postage paid at Bristol, CT 06010 and additional mailing offices.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010.

inside

Fuel: Still running scared

LUTHER S. MILLER

OPEC's muscle has gone to flab over the years; there's no longer an oil shortage; prices have tumbled; and railroads are getting around 30% more ton-miles to the gallon than they were getting a scant decade ago. Why, then, are they still running scared in the fuel conservation derby? The figures in the table below will tell you why.

While railroads have made tremendous strides in reducing fuel consumption since the energy crunch of the early '70s, and while the price of diesel fuel dropped from over $1.00 a gallon in 1981 to around 82½ cents in 1984, consumption remains high and the price per gallon is still over three times what it was in 1974. The result is an annual fuel bill for Class I railroads of around $2.8 billion. A penny saved on a gallon of fuel adds up to around $33 million in the till.

Saving money is not, of course, the only object of this exercise. Will there be another energy crisis down the line? "I'd bet my next paycheck that there's going to be one," an alternative-fuels researcher told *Railway Age*. When it does come, says an officer at the Southwest Research Institute, "Railroads will be head-and-shoulders above every other mode of transportation in knowing what can and cannot be done."

That's the "why" of the industry's undiminished drive to get more work out of less fuel. The "how" of it is described in Senior Editor Gus Welty's cover story (p. 39).

The railroad fuel story—1974-1984

	Diesel fuel price per gallon	Revenue ton-miles (millions)	Fuel consumed (million gallons)	Ton-miles per gallon
1974	26.59	850,961	4,023	211
1975	30.00	754.252	3,657	206
1976	32.38	794,059	3,828	207
1977	36.38	826,292	3,921	211
1978	37.90	858,105	3,898	220
1979	57.58	913,669	4,013	228
1980	83.00	918,621	3,890	236
1981	100.23	910,169	3,722	245
1982	95.43	797,579	3,130	255
1983	82.73	828,275	3,112	266
1984	82.59	921,542	3,354	275

How railroads rank as consumers

According to a 1984 study by the Oak Ridge National Laboratory, all forms of U.S. transportation consume 9,336,000 barrels of fuel a day (crude oil equivalent). Railroads account for only 3.2% of the total. Automobiles drink up 45.3%; trucks, 27.2%; water carriers, 7.9%; pipelines, 4.6%. Only buses (0.7%) rank below the railroads.

RAILWAY AGE

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Change of address should reach us six weeks in advance of next issue date. Send both old and new addresses with address label to Subscription Department, Railway Age, P.O. Box 530, Bristol, CT 06010 or call (203) 582-9546. Post Office will not forward copies unless you provide extra postage.

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ISSN 0033-8826/85 $2.00 + 0.00

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Market Outlook

Equipment

Georgia Power Co.: Will acquire 600 aluminum-bodied RD11 model hopper cars from Ortner Freight Car Co. Georgia Power currently has a fleet of 1,220 steel cars. The utility's fuel service general manager, David M. Ratcliffe, says that by substituting aluminum/steel cars for 15-year-old all-steel units, Georgia Power will be able to save its customers more than $2 million a year in freight costs. Earlier, Detroit Edison announced that it was acquiring 610 aluminum/steel cars from Greenville Steel Car. According to the Aluminum Company of America, these two orders mean that 43% of all coal cars ordered in the U.S. since 1983 have been of aluminum/steel construction. Among other companies using the lighter weight cars are South Carolina Public Service, Florida Power and Intermountain Power. Orders for more than 1,200 additional aluminum/steel coal cars are said to be pending.

Massachusetts Bay Transportation Authority: Awarded a contract to Knorr Brake Corp. for the supply of 139 air compressor assemblies to replace existing air compressors on MBTA's Boeing SLRV fleet. Deliveries will be completed this year.

Facilities

CP Rail: Is completing an $11.[illegible]-million (Canadian) upgrading of its Angus Shops in Montreal. The program includes modernization of the locomotive shop, construction of a new car and locomotive paint shop, and installation of a new robot welding system for traction motors. The paint shop, which is budgeted at $5 million, will be able to handle 1,400 cars and 92 locomotives a year.

New York MTA: General Railway Signal is the apparent low bidder, at $5.8 million, for a contract to modernize signaling on Metro-North's Hudson-Harlem line. The contract is for engineering design and providing GRS electronic traffic control equipment in wired steel cases and bungalows. Work is expected to be completed in 1987.

Revenue freight carloadings

Commodity	Sept. 7 week	Aug. 31 week	Aug. 24 week	Aug. 17 week
Grain	15,718	21,001	18,871	19,019
Other farm products	2,201	2,522	2,547	2,372
Metallic ores	9,711	13,205	14,082	14,356
Coal	105,334	117,569	117,233	123,845
Crushed stone, gravel and sand	11,595	13,813	13,699	13,667
Nonmetallic minerals	10,040	10,671	11,561	10,113
Grain mill products	8,723	10,703	10,367	10,488
Food and kindred products	9,521	11,416	11,150	11,185
Primary forest products	8,965	10,674	10,948	10,697
Lumber and wood products except furniture	5,436	7,415	7,187	6,904
Pulp, paper and allied products	12,445	13,845	13,559	13,518
Chemicals and allied products	21,449	24,933	24,397	23,200
Petroleum products	4,227	4,824	4,844	4,618
Stone, clay and glass products	9,605	11,018	10,804	10,904
Coke	4,542	5,309	5,042	4,617
Metals and products	7,368	9,399	8,098	7,991
Motor vehicles and equipment	17,877	22,379	20,987	17,842
Waste and scrap materials	7,063	9,175	8,847	8,561
Forwarder and shipper assn. traffic	5,833	7,198	7,055	6,878
All other carloads	52,948	64,103	62,097	59,227
LCL traffic	114	186	155	152
Total Cars Loaded	**330,715**	**391,358**	**383,536**	**380,154**
% change from previous year	(9.6)	(8.5)	(9.0)	(8.0)
Estimated revenue ton-miles (billions)	14.7	17.4	17.2	17.4
% change from previous year	(10.5)	(9.0)	(8.[illegible])	(5.7)

Cumulative Total:	**1985**	**1984**	**% change**
36 weeks	610.1	543.2	(5.2)

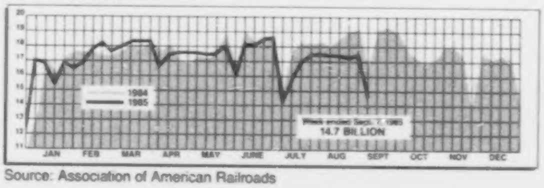
Piggyback loadings

	Aug. 31 week	Aug. 24 week	Aug. 17 week	Aug. 10 week
Trailers/containers	97,925	92,542	87,195	87,956

Cumulative total, 35 weeks		**% change from 1984**
Trailers/containers	2,988,639	(2.3)

Rail freight traffic trends

Billion ton miles (Estimated)



Source: Association of American Railroads

Freight cars

	DELIVERED			ORDERED			ON ORDER AND UNDELIVERED		
	August	8 months		August	8 months		Sept. 1,	Average Backlog	
	1985	1985	1984	1985	1985	1984	1985	1985	1984
Built new by carbuilders	1,034	7,646	7,615	770	6,702	11,581	3,594	4,036	6,404
Built new in RR shops	0	406	0	0	0	250	0	35	94
Built new—total	**1,034**	**8,052**	**7,615**	**770**	**6,702**	**11,831**	**3,594**	**4,071**	**6,498**
Rebuilt	0	0	0	0	0	0	0	0	0
TOTAL	**1,034**	**8,052**	**7,615**	**770**	**6,702**	**11,831**	**3,594**	**4,071**	**6,498**
Locomotives (new and rebuilt)	123	373	343	N/A	N/A	N/A	230	260	165

Source: Transportation Div., AAR and American Railway Car Institute

Lines on Labor

UTU members are beating the cost of living—and how!

If you ever wonder why railroads sometimes have such a tough time competing on price with the guys who operate on the highways, consider a couple of things just as they relate to crew members represented by the United Transportation Union.

GUS WELTY

First, agreements negotiated over the past 11 years have raised UTU members' wages by 209%. Over the same period, the cost of living went up by 92.8%.

Second, UTU (and other) union employees don't pay a penny toward the cost of their health-and-welfare benefits.

Third, nobody has had to take a pay cut at any time. No concessions have been made at all, during a period in which concessions were the rule in a whole bunch of other hard-pressed industries including the motor-carrier industry.

Fourth, UTU members "at the present time are the highest paid union employees on an annual basis in the country."

Those members and that "highest-paid" quote don't come from complaining members of the management fraternity, nor from National Railway Labor Conference Chairman Chuck Hopkins nor from Association of American Railroads President Bill Dempsey nor from some irate railroad chief executive officer. Nosirree.

The numbers and the quote came straight from UTU President Fred Hardin, defending himself against the flak that came skyward when he and a majority of UTU's negotiating team recommended a tentative settlement only to see it fail in a ratification vote.

It's true that the "rejection" was hardly that, in any generally-accepted definition of the word. Six of the seven crafts represented within UTU approved the proposed agreement, but the union's Constitution demands that all crafts vote "aye" (*RA*, Sept., p. 20), and the locomotive firemen voted "nay."

Still, union chiefs are political animals and they're sensitive to rejection of any kind. And in this case, Fred Hardin may have received some pretty spicy mail from some of the folks who didn't much like what he had recommended. Otherwise, it would hardly have seemed necessary for him to point out to his members that "I am not a Judas, not a crook, have not lost my mind, nor have I received any 'cash' from any railroad."

It has appeared that the firemen's vote-down was based on [illegible]-information which made it seem that the demise of the craft was not eventual but imminent. Whatever, the firemen's decision forced Fred Hardin into a position he didn't want to occupy. As he put it, he and a majority of the bargaining team "were not willing to require you to strike and jeopardize the future of your families, your homes, your jobs and your seniority just to show that we have guts." The proposed agreement, he said, preserved benefits and kept UTU "more than even on compensation." He preferred to try again, he indicated, when the economy got better and there was a new Administration in Washington. As for the fortitude-factor, he added, "Courage, or guts, is oftentimes valuable, but intelligence and picking the right time to exhibit guts is oftentimes more important."

President Reagan created an emergency board late in August, and at that point the dispute went the way Fred Hardin says he didn't want it to go, into the hands of a board appointed by the present Administration, which he regards as anti-labor.

It's ironic if, in fact, the impending demise of the fireman craft triggered all this. Dieselization was virtually complete by 1958 when just 1,350 steam locomotives remained in service and so by every bit of technological and economic reasoning the craft should long ago have become a paragraph in the history books.

After all, as a former vice president of UTU itself once said, the union had enough to do in protecting present members, without worrying about unborn generations. He was right.

But, sigh, this is railroading, and the firemen-who-tend-no-fires are still around to raise a ruckus.

Still, though, to come full circle, it's not the firemen alone who have caused the real economic problem, not with pay hikes outstripping inflation by better than two-to-one and not if, as Hardin claims, UTU members really are king-of-the-hill on payday. It's tempting to think of the new and better services that railroads might be providing if somewhere, sometime, a line had been drawn. Tempting, yes. Sad, too.

Class 1 railroad employment

Employee Group	No. of employees, mid-month count July 1985	Percent of change July 1985 from July 1984	June 1985
Total—all employees	305,355	d 7.53	d 1.22
Executives, officials and staff assistants	13,712	d 1.17	d .70
Professional and administrative	57,237	d 7.74	d .21
Maintenance of way and structures	66,336	d 6.60	d 1.23
Maintenance of equipment and stores	55,431	d 10.46	d 1.53
Transportation (other than train and engine)	20,144	d 10.28	d 1.18
Transportation (train and engine)	92,495	d 6.50	d 1.75

Source: ICC

Santa Fe's Cena sets retirement

Lawrence Cena, long regarded as the possessor of one of the railroad industry's most innovative minds, will retire March 31, 1986, as president and chief executive officer of Santa Fe Railway. John Swartz, vice chairman of parent Santa Fe Southern Pacific Corp., will now take over Cena's responsibilities for planning and implementing the merger of Santa Fe Railway with Southern Pacific Transportation Co., and will become president of the new railroad, Southern Pacific & Santa Fe, if the merger application is approved and the merger is consummated.

Cena's career with Santa Fe will have spanned 38 years by the time of his retirement. He has been president of the railway since January 1978, adding the title of chief executive officer in April 1982. When Santa Fe Industries and Southern Pacific Co. were merged in December 1983, he became active in preparing for the railway merger case. He has also led a top-level team of Santa Fe and SPT officers in planning for the actual rail merger.

Swartz, an attorney, joined Santa Fe Railway in 1961. He was executive vice president of the railway in 1983. That same year he was named president of SFI and he assumed additional responsibilities as vice chairman of SFSP upon its formation in December 1983; in this role, he has had oversight responsibilities for Santa Fe Railway.

Lawrence Cena

John Swartz

Larry Cena had this observation about his reasons for announcing his retirement: "It would be an exciting and interesting challenge to be involved in the actual merger of the railroads into the efficient system we have proposed. It now appears, however, that the ICC decision will nearly coincide with my retirement plans, and I believe it is appropriate for the merged railroad to start with a president who will be able to serve through its formative years."

Rules proposed for cabooseless trains

Reacting to technological and operational change, the Federal Railroad Administration is proposing new rules to better accommodate operation of cabooseless trains. Two notices of proposed rule-making were issued last month; hearings will be held Oct. 23 and 24 in Washington, with the file kept open for written comments until Oct. 31.

The first proposed rule has to do with the inspection of rear-end markers, the second with intermediate terminal air brake tests. Both rules take into account the increasing number of road trains being operated without a caboose and the development of telemetry devices which provide locomotive cab readouts concerning marker and brake conditions. In addition, the proposed marker rule would allow visual inspection by qualified personnel who are not crew members and would provide for protection of those inspectors.

In each case, FRA sees cost-benefit ratios heavily weighted on the benefit side due to the avoidance of train delays: For the marker rule, FRA estimates first-year costs at $1.3 million and annual benefits of $9.8 million per year; for the brake rule, it uses the same cost estimate and figures the benefits at more than $11.1 million per year.

Essentially, what FRA is saying is that if telemetry devices are proved capable of making the required rear-end marker and air brake inspections and tests, then railroads can use them without having to use a crew member from the head-end in a cabooseless operation. Where telemetry devices are not available, FRA is saying that non-crew personnel could make the marker check, provided that the person doing the job is in communication with the locomotive engineer to insure against train movement while the inspection is being performed.

In yet a third action, FRA filed a notice of special safety inquiry and scheduled a Washington hearing for Oct. 25 to evaluate the impact of the 1983 change in the power brake regulations.

Rate of return drops below 5%

Railroad operating revenues declined 5.5% in this year's first half, reflecting a 3.7% drop in traffic. Operating expenses were down only 3.4%. As a result, net revenue from operations declined 19.5%, and ordinary (net) income was down 24.5%.

The actual figures: Operating revenues during the first six months of 1985 added up to $14.070 billion, compared with $14.888 billion in the year-ago period. Operating expenses were $12.534 billion, compared with $12.979 a year earlier. Net revenue from operations fell from $1.909 billion to $1.536 billion, and ordinary income fell from $1.401 billion to $1.057 billion.

For the 12 months ended June 30, the industry's rate of return on net investment dropped to 4.97% from 5.66%.

Class I Railroads in the United States For the First Six Months

	1985 (millions)	1984 (millions)
Operating Revenues	$14,070.2	$14.887.8
Operating Expenses	12,534.4	12,978.7
Net Revenue from Operations		
United States	1,535.9	1,909.2
Eastern District	481.8	582.1
Southern District	367.6	456.7
Western District	686.5	870.4
Rate of Return on Net Investment[1]	4.97%	5.66%
Ordinary Income		
United States	1,057.3	1,401.0
Eastern District	390.8	511.4
Southern District	241.5	294.6
Western District	425.0	595.0

[1] Rate of return for 12 months ended June 30

Source: Association of American Railroads funding these extensions," says Glenn, "and have mapped out a program of advisory votes for subsequent general elections to take the pulse of the people on three vital points: Do they want us, are they willing to pay for us, and how do they want to make that payment?

"And now we are into the financial big leagues. Federal drawstrings are drawing even tighter on the UMTA purse, and alternate sources of revenue must be found if we are to push BART into non-service areas. We have been encouraged of late by expressions of support for additional sales or gasoline taxes from these areas to support our program.

"This, however, is far from voter approval, and a lot of grassroots work has to be done by some pretty enthusiastic people before we can ever address the funding need by means of a ballot measure.

"It is becoming more apparent that we will have to offer a package proposition which will upgrade and repair roadways along with fixed-rail projects, before we can win the political support for any extension program."

Elections this fall will test the climate in San Mateo County, which was part of the original BART district. The county pulled out just months before BART construction started in 1962, fearing high property taxes and expecting to rely on Southern Pacific commuter service.

Since then, commercial development and population have soared, and in November San Mateo County residents will have a chance to show whether or not their views on transit have changed. They'll be asked to approve a change in the use of sales-tax revenue, now restricted to business development.

That would allow the county to hook into BART by funding the construction of a new station at Colma, south of Daly City. And it would send an important signal throughout the Bay Area.

Some planners see BART eventually stretching through San Mateo County to San Jose in Santa Clara County. BART planners see their route reaching past Colma at least to San Francisco International Airport.

Lending urgency is road congestion. "Massive traffic jams are in store for the San Francisco Bay Area Peninsula commuters, unless the jurisdictions along the Route 101 Corridor in Santa Clara, San Mateo and San Francisco counties can arrive at a consensus as to what if any transportation improvements are desired and whether they are willing to pay for them," says the Bay Area Monitor, a publication of the League of Women Voters of the Bay Area.

"Transportation planning to mitigate traffic impacts has not kept pace with accelerated economic growth and land development. As a result, Bay Area transportation problems are rapidly leading to gridlock.

"The problem of transportation has never loomed larger in Peninsula life. Yet never have so many governmental and private groups and individuals spent so much time grappling for a solution." ■

REVENUES AND EXPENSES OF RAILWAYS

Second quarter figures of calendar year 1985

(Dollar figures are stated in thousands, i.e., with last three digits omitted)

		Operating revenues				Operating expenses													
						Way & structures			Equipment									1985		
		Freight	Other	Total 1985	Total 1984	Total 1985	Total 1984	1985 Deprec.	Total 1985	Total 1984	1985 Deprec.	Total 1985	Total 1984	Operating Ratio 1985	Operating Ratio 1984	Income after fixed charges 1985	Income after fixed charges 1984	Net Ry. operating income	Net income 1985	Net income 1984
Amtrak	3 mos.	—	217,420	217,420	186,673	57,578	65,114	20,722	95,884	95,404	20,709	399,390	390,613	183.69	209.24	(176,879)	(200,096)	(181,970)	(176,879)	(200,096)
	6 mos.	—	392,964	392,694	346,078	120,236	131,934	41,409	194,555	185,850	41,051	806,538	776,813	205.24	224.46	(402,278)	(420,234)	(413,574)	(402,278)	(420,234)
Atchison, Topeka & Santa Fe	3 mos.	531,566	11,464	543,030	573,842	89,638	84,751	14,446	122,138	132,263	24,007	497,786	519,867	91.66	90.59	40,588	51,763	37,572	32,712	35,027
	6 mos.	1,069,078	23,056	1,092,134	1,155,541	181,180	169,954	28,816	252,849	274,048	47,831	1,022,150	1,052,944	93.59	91.12	74,881	98,768	55,823	60,281	66,678
Baltimore & Ohio	3 mos.	249,347	10,484	259,831	281,911	42,333	47,213	10,317	74,366	60,355	7,324	253,862	250,915	97.70	89.00	5,723	30,729	13,760	8,131	21,125
	6 mos.	504,211	20,623	524,834	547,269	88,595	94,375	20,510	144,107	119,726	14,584	513,778	502,482	97.89	91.81	13,969	42,411	22,599	11,644	29,552
Boston & Maine	3 mos.	28,868	1,369	30,237	31,924	3,921	4,783	414	614	9,478	69	29,163	29,772	96.44	93.25	1,162	2,244	1,148	1,162	2,244
	6 mos.	56,465	2,568	59,033	63,105	8,077	8,868	830	795	18,477	128	57,725	59,574	97.78	94.40	2,079	4,242	1,456	2,079	4,242
Burlington Northern	3 mos.	979,366	22,334	1,001,700	1,095,780	146,863	153,688	42,473	180,702	198,723	16,050	805,396	865,587	80.40	78.99	196,249	234,884	114,562	114,497	137,387
	6 mos.	2,013,850	43,446	2,057,296	2,219,798	319,019	304,946	84,770	368,383	396,668	32,674	1,667,243	1,767,844	81.04	79.63	395,291	476,356	227,982	233,200	277,192
Chesapeake & Ohio	3 mos.	271,221	9,661	280,882	303,612	33,777	36,672	8,972	52,447	63,974	3,908	211,507	238,638	75.30	78.66	72,243	85,558	45,073	47,933	60,275
	6 mos.	495,796	15,629	511,425	551,539	69,221	75,217	17,914	104,934	121,891	7,655	423,418	469,071	82.79	85.04	102,741	114,841	53,212	67,933	80,978
Chicago & North Western	3 mos.	183,452	26,028	208,480	222,796	38,890	31,161	7,093	47,991	51,389	3,975	198,252	201,412	95.09	90.40	2,375	13,729	10,425	2,575	11,804
	6 mos.	361,850	51,264	413,114	455,400	79,155	68,422	14,151	97,095	108,319	8,096	405,548	424,386	98.16	93.18	(12,510)	15,329	9,713	(10,335)	13,179
Conrail	3 mos.	796,347	28,315	824,662	870,860	107,902	115,363	21,971	172,618	185,557	34,396	691,253	696,904	83.82	80.02	154,812	178,949	100,632	154,812	178,949
	6 mos.	1,556,128	57,206	1,613,334	1,711,564	238,298	247,342	44,647	349,316	384,025	70,756	1,434,241	1,452,785	88.89	84.88	209,485	269,809	134,695	209,485	269,809
Delaware & Hudson	3 mos.	27,273	386	27,659	31,624	4,297	5,535	261	7,530	8,806	159	27,001	31,483	97.62	99.55	1,007	(397)	686	1,007	(397)
	6 mos.	53,031	928	53,959	62,215	9,276	10,478	523	15,986	18,226	311	56,296	63,312	104.33	101.76	(2,425)	(2,091)	(2,280)	(2,425)	(2,091)
Denver & Rio Grande Western	3 mos.	83,311	1,127	84,438	93,246	12,905	14,603	3,689	15,190	18,052	3,323	74,234	83,960	87.91	90.04	8,724	10,507	6,884	5,286	6,963
	6 mos.	166,984	2,472	169,456	181,461	27,032	28,546	7,152	30,850	35,046	6,648	151,141	164,738	89.19	90.78	18,036	15,121	11,802	11,281	10,034

Elgin, Joliet & Eastern	3 mos.	16,771	7,060	23,831	26,637	3,502	4,356	574	3,622	5,440	2,024	21,735	23,639	91.20	88.74	3,633	5,282	441	1,978	3,131
	6 mos.	31,112	13,426	44,538	54,194	6,573	7,466	1,170	6,879	8,641	4,037	42,058	46,505	94.43	85.81	5,453	10,934	140	3,113	6,416
Florida East Coast	**3 mos.**	**27,630**	**418**	**28,048**	**30,991**	**4,866**	**4,360**	**1,245**	**5,801**	**4,796**	**997**	**23,269**	**21,774**	**82.96**	**70.26**	**10,362**	**13,980**	**588**	**6,151**	**8,325**
	6 mos.	**58,385**	**991**	**59,376**	**62,165**	**9,636**	**8,724**	**2,481**	**11,363**	**10,168**	**1,986**	**46,003**	**44,259**	**77.47**	**71.19**	**22,133**	**25,865**	**3,929**	**12,689**	**15,271**
Grand Trunk Western	3 mos.	82,672	3,05	85,729	85,756	10,796	10,115	1,667	19,351	19,045	1,767	84,877	82,619	99.00	96.34	349	1,199	1,296	2,444	1,676
	6 mos.	167,966	6,565	174,531	170,309	1,365	20,257	3,325	36,518	38,526	3,310	172,114	166,131	98.61	97.54	655	756	3,073	3,818	2,743
Illinois Central Gulf	**3 mos.**	**204,700**	**18,715**	**223,415**	**241,087**	**27,832**	**29,234**	**11,767**	**68,517**	**67,530**	**4,916**	**210,751**	**224,733**	**94.33**	**93.21**	**6,252**	**14,699**	**12,154**	**5,580**	**12,940**
	6 mos.	**427,845**	**37,430**	**465,275**	**495,509**	**59,709**	**59,218**	**23,275**	**140,073**	**140,010**	**10,216**	**440,772**	**461,623**	**94.73**	**93.16**	**11,116**	**30,039**	**22,816**	**9,105**	**26,120**
Kansas City Southern	3 mos.	78,678	3,605	82,283	81,038	12,181	12,406	3,644	17,869	18,803	5,573	69,612	69,274	84.60	85.48	10,736	9,659	8,713	6,660	6,161
	6 mos.	154,207	7,100	161,307	163,371	23,296	24,473	7,202	36,188	39,309	10,801	139,330	140,468	86.37	85.98	18,062	18,605	15,100	10,953	11,599
Missouri-Kansas-Texas	**3 mos.**	**68,361**	**3,043**	**71,404**	**71,605**	**13,474**	**13,693**	**2,569**	**16,546**	**18,390**	**1,766**	**66,184**	**67,255**	**92.68**	**93.92**	**2,912**	**1,892**	**5,515**	**2,912**	**1,892**
	6 mos.	**130,831**	**6,265**	**137,096**	**140,867**	**25,933**	**25,159**	**5,090**	**32,666**	**35,386**	**3,566**	**129,293**	**131,454**	**94.30**	**93.31**	**2,814**	**4,738**	**2,554**	**(2,986)**	**4,738**
Missouri Pacific	3 mos.	401,403	11,170	412,573	451,409	61,801	65,911	12,595	104,385	102,059	18,482	399,068	402,402	96.72	89.14	2,629	45,810	14,784	1,595	33,087
	6 mos.	832,595	22,654	855,249	894,522	126,701	126,373	24,672	207,539	190,642	37,150	802,823	794,271	93.87	88.79	29,817	88,354	56,475	29,222	62,087
Norfolk & Western	**3 mos.**	**433,396**	**18,631**	**452,027**	**455,029**	**55,417**	**66,829**	**11,124**	**84,599**	**84,890**	**13,184**	**327,303**	**353,143**	**72.40**	**77.60**	**141,792**	**128,589**	**66,824**	**83,248**	**77,290**
	6 mos.	**844,353**	**34,153**	**878,506**	**893,241**	**117,301**	**143,897**	**21,618**	**171,991**	**167,643**	**26,148**	**678,759**	**711,486**	**77.26**	**79.65**	**235,287**	**228,382**	**104,977**	**139,216**	**134,744**
St. Louis Southwestern	3 mos.	97,532	1,364	98,896	112,925	13,534	12,860	4,606	26,396	26,876	5,469	94,830	100,305	95.88	88.82	5,665	16,482	2,188	3,787	11,260
	6 mos.	196,156	3,145	199,301	224,129	28,504	27,248	8,984	54,080	55,179	11,071	192,315	198,288	96.49	88.47	10,066	31,530	3,440	6,520	21,249
Seaboard	**3 mos.**	**649,203**	**15,601**	**664,804**	**699,500**	**91,020**	**87,132**	**18,172**	**168,253**	**173,590**	**19,870**	**584,199**	**597,278**	**87.87**	**85.38**	**81,409**	**104,969**	**63,980**	**60,961**	**70,992**
	6 mos.	**1,307,666**	**35,480**	**1,343,146**	**1,407,129**	**176,257**	**169,472**	**36,344**	**342,327**	**339,716**	**38,217**	**1,179,829**	**1,187,582**	**87.84**	**84.39**	**173,917**	**221,314**	**119,121**	**121,896**	**146,550**
Soo Line	3 mos.	160,304	5,281	165,585	71,858	34,354	16,163	6,804	42,173	16,654	3,554	166,564	70,890	100.59	98.65	(11,020)	2,081	6,003	(4,716)	1,589
	6 mos.	276,878	8,031	284,976	155,393	55,341	29,811	11,347	70,670	36,038	6,535	279,525	146,966	98.08	94.57	(8,324)	10,150	11,900	(2,945)	6,489
Southern	**3 mos.**	**424,893**	**9,894**	**434,787**	**462,577**	**63,913**	**60,560**	**19,098**	**89,877**	**91,204**	**19,185**	**340,265**	**359,744**	**78.26**	**77.76**	**92,244**	**102,866**	**58,385**	**54,727**	**60,083**
	6 mos.	**846,956**	**20,948**	**867,904**	**905,312**	**125,996**	**122,328**	**37,293**	**183,899**	**181,504**	**38,295**	**701,505**	**719,975**	**80.82**	**79.52**	**166,413**	**183,797**	**100,561**	**97,835**	**106,635**
Southern Pacific	3 mos.	521,769	15,564	537,333	560,810	65,217	54,586	23,311	143,857	159,617	19,947	521,813	551,213	97.11	98.28	28,336	16,441	18,811	31,225	30,895
	6 mos.	1,025,846	32,117	1,057,963	1,108,239	142,451	116,630	46,214	296,965	322,693	40,285	1,069,788	1,100,918	101.11	99.33	107	32,189	(6,480)	4,814	59,809
Union Pacific	**3 mos.**	**480,143**	**4,386**	**484,529**	**468,903**	**72,902**	**69,198**	**17,181**	**88,236**	**103,458**	**22,741**	**402,771**	**421,164**	**83.12**	**89.81**	**80,421**	**46,141**	**58,385**	**56,991**	**31,586**
	6 mos.	**961,044**	**10,262**	**971,306**	**971,336**	**145,135**	**143,436**	**34,185**	**192,788**	**217,744**	**45,680**	**838,956**	**877,544**	**86.37**	**90.34**	**137,066**	**88,121**	**88,355**	**92,956**	**58,321**
Western Pacific	3 mos.	41,462	655	42,117	39,259	10,125	5,581	776	11,493	8,491	318	51,758	38,320	122.89	97.60	(14,680)	(1,245)	(2,488)	(7,527)	246
	6 mos.	74,042	1,130	75,172	78,463	16,178	12,840	1,765	19,181	17,342	1,915	89,750	81,963	119.39	104.46	(18,138)	(8,354)	(4,373)	(7,933)	(3,263)

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